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GIFFORD PINCHOT, Forester.

A

HISTORY OF THE LUMBER INDUSTRY

IN THE

STATE OF NEW YORK.

BY

WILLIAM F. FOX.

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BUREAU OF FORESTRY.

Forester, GIFFORD PINCHOT.
Assistant Forester, OVERTON W. PRICE.
Assistant Forester, GEORGE B. SUDWORTH.
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Superintendent of Tree Planting, WILLIAM L. HALL.

ILLUSTRATIONS.

A HISTORY OF THE LUMBER INDUSTRY IN THE STATE OF NEW YORK.

INTRODUCTION.

From the time when the pioneers first swung their axes in the primeval forests of New York, lumbermen have been closely connected with the industrial progress and development of the State. The first settler was the first lumberman; and his work commenced when he felled the trees to make a clearing in the forest for his cabin and his crops. Although this use of the ax alone would hardly constitute lumbering as understood to-day, still it was not many years until a sawmill appeared in each settlement and the lumber industry was formally inaugurated.

Of necessity, the first colonists went without sawmills longer than the later ones. They made rough lumber for their houses, barns, and fences with their axes, supplemented at times by saws, large and small, worked by hand-power. But in the later settlements, which in the beginning of the last century included three-fourths of the State, a sawmill was built in each locality within ten or fifteen years after the first family moved in. In many instances the sawmill preceded the gristmill; and in a few places the erection of the mill antedated the advent of the first settlers.

Whatever means the first colonists used in converting trees into lumber, the methods of logging must have been substantially the same as those of to-day. From the first settlements to the present time lumbermen have never resorted to "clearing" operations in carrying on their New York work. There is, however, a widespread impression to the contrary, and people are very apt to attribute the absence of forests to the work of the lumbermen. This is an error. The disappearance of the forest is due to the farmer, not to the lumberman. In clearing his land the farmer cuts and burns every tree and bush for the purpose of improving his land. The lumberman takes only a few scattered trees to the acre, confining his selection to some merchantable species. The carelessness of the farmers in burning their brush and log heaps has caused many of the fires that have destroyed so much of our forests. Lumbermen do not start fires for their work. The

cutting and skidding are mostly done in the late fall, and the log-hauling in the winter, when the woods will not take fire. Had no other industry but lumbering been carried on within our borders, the once unbroken forests of New York would still be standing.

THE PRIMITIVE FOREST: ITS COMPOSITION.

In 1614, the year when the first houses were built at Albany and on Manhattan Island, the territory which now constitutes the State of New York was forest-covered throughout. Some Indian tribes belonging to the Six Nations had cleared small areas near their villages, on which they raised corn; and, on the east side of the Hudson River, were some openings caused by forest fires which the red men had started in order to facilitate hunting. But these clearings formed an insignificant portion of the entire region. It was a silent, unbroken wilderness—a primeval forest, which in grandeur and undeveloped wealth was unsurpassed in all the region of the Atlantic coast.

New York was not only a forest State, but essentially a white-pine State. This valuable species was plentiful throughout the territory. It was conspicuous everywhere by its towering size, although not as abundant as some of the inferior and smaller associated species. In height, diameter, and quality of timber the pines of New York compared favorably with those of any other region on the continent. The height ranged from 130 to 160 feet, with a diameter, breasthigh, between 2 and 4 feet. In some localities there were individuals of still greater size. Occasional trees are said to have been 255 feet high and about 80 inches in diameter. There is record of a White Pine cut in the town of Meredith, Delaware County, that measured 247 feet in length as it lay on the ground. Many New York lumbermen still living recall giant White Pines that measured 7 feet or more across the stumps and over 220 feet in height.

There is ample historical evidence of the uniform distribution of this species throughout the State. The history of Delaware County states that "the town of Walton when first settled was heavily timbered with pine and some hemlock, which at an early day was rafted to Philadelphia in lumber or logs, constituting the all-absorbing industry from which the land debts and living expenses were paid," and that "the mountain east of the village of Walton received its name from the immense pines that covered its sides, and the entire valley of the village was a dense forest of the same." The history of Cattaraugus County tells of the "remarkable size and good quality" of the White Pine in the southwestern part of New York. Holden's History of Warren County mentions "the splendid pines with which the great Brant Lake tract abounded." The writer—whose grandfather and father were the pioneer lumbermen of that famous tract—well remembers hearing in his boyhood the White Pine of that region enthusiastically described as being "clear as a hound's tooth." The meaning of the Indian name

Schenectady, "the end of the pine plains," indicates that this species was conspicuous in that region, although it seems that there it was largely mixed with Pitch Pine. We are told that Pine street in New York City took its name from the "many magnificent pines" that adorned the farm of Jan Jansen Damen.[a]

Peter Kalm, the Swedish naturalist, who visited Albany in 1749, writes: "The White Pine is found abundant here. The greater part of the merchants have extensive estates in the country and a great deal of wood. If their estates have a little brook, they do not fail to erect a sawmill upon it for sawing boards and planks, with which commodity many yachts go during the summer to New York, having scarce any other lading than boards. They saw a vast quantity of deal from the White Pine on this side of Albany, which is exported."

The younger Michaux states that in 1801 "the shores of Lake Champlain appeared to be most abundantly peopled with this species."

Dr. Torrey wrote in 1843: "The White Pine is found in most parts of the State;" and further, "Our chief extensive forests of this noble and most valuable tree" are "on the headwaters of the Hudson and on the rivers which empty into the St. Lawrence; on the Salmon and Black rivers, which empty into Lake Ontario; on the headwaters of the Delaware and Susquehanna, and on the headwaters of the Allegheny and Genesee." This distribution includes substantially the entire State except the lowlands, from which the White Pine had been taken by the early settlers long before Torrey wrote.

The Adirondack tourist of to-day can still see in the tall trees at Paul Smith's, or in the noble colonnade of White Pine along the shores of Forked Lake, further evidence of its extensive habitat.

The Catskill region was also rich in White Pine, with a strong admixture of Hemlock on its mountainous slopes. The Ulster County Gazette contains an advertisement, dated November 13, 1799, which reads as follows:

FOR SALE.

The one-half of a

SAWMILL

With a convenient place for building, lying in the town of Rochester.[b] By the Mill is an inexhaustible quantity of PINE WOOD.

* * * * * *

Any person inclined to purchase may know the particulars by applying to

JOHN SCHOOMAKER, Jun.

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[a] New York Historic Trees. New York Times, May 12, 1901.

[b] Town of Rochester, Ulster County; not the city of that name.

The advertiser and his fellow lumbermen of that region have long since gone their way, and with them their "inexhaustible quantity of Pine Wood."

With the White Pine there was in many localities an admixture of Norway Pine; and in Steuben County, or along the southern border, considerable Shortleaf Pine (*Pinus echinata* Mill.), known in that locality as Yellow Pine.

The White Pine, being the most valuable of all the forest trees, was taken first, and, until 1850 or thereabouts, lumbering was confined almost exclusively to this species.

Next in importance atthat time was the Hemlock, which was likewise distributed over the whole territory. Though of inferior dimensions and quality throughout the Adirondack region, in the southern tier of counties and along the Catskill Range it attained a size and strength that compared favorably with the best Pennsylvania Hemlock.[a] But, for a long period, it had no value except for tan bark. The trees were cut and peeled, and the bark hauled to the tanneries; the fallen tree trunks were left in the woods to decay. This was largely the case until within twenty-five years, especially in Pennsylvania, the demand for bark being greatly in excess of the demand for hemlock lumber. Not until there was a scarcity of spruce and pine did lumbermen find it profitable to cut Hemlock for market, and then for many years the margin of profit was very small.

The spruce, which in late years has formed so large a part of our lumber product, was confined mostly to the Adirondack plateau and Catskill slopes. It was not generally found in the western or southwestern portions of the State, nor in the southern tier of counties along the Pennsylvania line, west of Broome County.

The other evergreen species of the State were not extensively used for lumber until quite recently. The Balsam, which is confined chiefly to the Adirondack forests, is now used for lumber and also for pulpwood in a certain percentage of mixture with spruce. The White Cedar has a steady demand, where accessible, for the manufacture of shingles, fence posts, and telegraph poles.

The hardwoods, or broadleafed trees, were everywhere mixed more or less with the evergreens. In some places within the primeval forests there were "hardwood ridges," so called because there were no other species; and in other places there were slopes on which pine,

[a] In the town of Colchester, Delaware County, there is a Hemlock tree over 2 feet in diameter standing on the line between divisions 63 and 64, upon the north side of the hill, opposite the schoolhouse in the Wilson Hollow. In 1535, while it was a young tree about 6 inches through, it was marked by some sharp instrument, probably an Indian weapon. Two hundred and fifty-three annual rings of growth over this mark is a blaze made by James Cockburn in 1788, and over another twenty-eight annual rings is a blaze made by Christopher Tappen in 1816.

Hemlock, or spruce grew unmixed in pure stands or "clumps." Along the river valleys where the soil was rich and dark with alluvial deposits, the more valuable hardwoods—White Oak, White Ash, Black Cherry, and Black Walnut—predominated. Maple, Beech, and birch grew everywhere, on mountain and plain; but there was no Chestnut or oak on the great northern plateau, and there is none there now.

Until recent years lumbermen paid but little attention to the hardwoods, and but few were cut except for cooperage, furniture, or pyroligneous acid—industries which until quite recently were never prominent in this State.

As fast as the lumbermen took out the pine and Hemlock, however, the great hardwood forests that remained fell beneath the axes of advancing farmers, and disappeared in fire and smoke.

BEGINNINGS OF LUMBERING.

The evolution of the sawmill is largely due to the conditions and demands of the lumber industry in America. Our early colonists built and operated sawmills one hundred years or more before there was one in England. This method of manufacturing was not, however, absolutely necessary. The wainscotings, paneled ceilings, cabinetwork, and Chippendale furniture which made famous the stately homes of England were constructed in all their perfection long before the first sawmill was erected in that country. The men who founded the Massachusetts Bay Colony, together with the emigrants who followed them for a hundred years, had never seen a sawmill in their native land. So, if a sawmill did not always appear in a colony soon after the first settlement, it does not follow that no lumbering was carried on. They had other means of manufacturing the forest products.

The pioneer of the wilderness, with ax and wedge, could easily supply his few wants in this respect; but in the villages which sprang up at each important trading post there was a demand for building material and ship-timber which the villagers themselves could not well supply. Most of them were engaged in better paying pursuits or professions; hence, some labor found employment in manufacturing lumber by hand-power. The large timbers for house and ship building were hewn out and squared with a broadax by men who were experts with this tool. The planks, boards, and boat sides were mostly made by pit-sawing. The latter was a common industry in the old country; and one reason why England had no sawmills until after 1768 was because the mobs, always opposed to labor-saving machinery, destroyed the first ones as fast as erected through fear that the pit-sawyers would be thrown out of employment.

PIT-SAWING.

Pit-sawing was done by two men with a long saw that had cross handles on each end. A stick of timber, hewed square, was placed over a pit, or elevated on trestles. One man stood on top of it and pulled the saw up, and one man stood in the pit below to pull the saw down. (Pl. I.) The workman on top, who guided the saw along the chalk line, and who was supposedly the better man, was called the top-sawyer. The one below was called the pit-man. When sawmills were first substituted in this work the saw was held taut on the upward stroke by a spring pole overhead, and was worked up and down by a wooden beam attached to a crank on the mill wheel. This wooden beam was called the pitman, and is still known by that name in every sawmill throughout the country. Pit-sawing or whip-sawing, as it is often called, was not entirely abandoned on the introduction of sawmills. This old method was still useful in sawing long stuff, because in many mills the log-carriage was not long enough to saw planks of the desired length. As late as 1860, at the gang-mills near Painted Post, Steuben County, the writer saw a large, square stick of timber being sawed in this fashion into long planks for the sides of a canal boat.

THE FIRST SAWMILLS.

John Verrazzano and Hendrick Hudson made their famous discoveries and sailed away without leaving a man behind to occupy the newly found territory. No settlement was made by white men, no house erected, until 1614. Just when the labor of the settlers first took the form which we now call lumbering it is impossible to say, but in 1623, nine years after the first house was built at New Amsterdam, three sawmills were erected there by the Dutch West India Company; and, with their erection, commences the history of lumbering in the State of New York.

The machinery for these mills, which was shipped from Holland, was constructed to run by water-power or by windmill. One of them was built on Governors Island, and was probably operated by wind-power; another, which stood on Sawmill Creek, a tributary of the East River, may have used a water-wheel. In 1639 the mill on Governors Island was leased at an annual rental of 500 merchantable boards, half oak and half pine.

About the same time, perhaps a little earlier, some sawmills were built at Fort Orange (Albany) or in its immediate vicinity. Andries Corstiaensen, a master millwright, with two sawyers, was sent there from Holland in 1630. Among the settlers at Rensselaerwyck (Troy), in 1630, were Lawrens Lawrenssen and Barent Tomassen, sawyers.[a]

[a] History of Albany County, by George R. Howell. New York: W. W. Munsell & Co. 1886.

PIT-SAWING.

FIG. 1.—AN OLD-FASHIONED MILL, SHOWING GUIDE BLOCKS.

FIG. 2.—MILL IN ULSTER COUNTY, SHOWING SAW GATE. OLDEST MILL IN THE STATE, BUILT IN 1803.

AN OLD OVERSHOT WATER WHEEL.

In 1636 Barent Pieterse Koeymans joined the colony, and in the fall of 1645 took charge of the Patroon's sawmills, being allowed 150 guilders a year for board and 3 stuyvers for every plank he sawed. In two years this mill cut over 4,000 boards. In 1673 Koeymans bought a large tract of land on the Hudson River, 12 miles south of Albany (the location of the present town of Coeymans), on which there were some desirable mill-sites, and where Cruyn Cornelissen and Hans Jansen had erected sawmills as early as 1651.

The colonists soon made other settlements in the Hudson Valley, and in 1661 Frans Pieters Clavers built a sawmill on the little stream which runs into the river 2 miles north of Stuyvesant Landing, in what is now the town of Kinderhook, Columbia County. This stream has been known as the Saw Kill ever since. In 1663 a sawmill was built by Jan Barentsen Wemp on the Poesten Kill, a stream which empties into the Hudson at Troy. As the falls of the Poesten Kill (Puffing or Foaming Creek) furnished a strong water-power, it may be assumed that this mill was driven by a water-wheel.

In a letter to the Lords of Trade, England, dated January 2, 1701, the Earl of Bellomont says:[a]

> They have got about 40 sawmills up in this province [the province of New York] which I hear rids more woods or destroys more timber than all the sawmills in New Hampshire. Four saws are the most in New Hampshire that work in one mill, and here is a Dutchman, lately come over, who is an extraordinary artist at those mills. Mr. Livingston told me this last summer he had made him a mill that went with 12 saws. A few such mills will quickly destroy all the woods in the province at a reasonable distance from them.

For the first two hundred years the mills were of rude construction and of small capacity, being limited to a single upright saw. At first the saw was attached directly to the pitman, the blade being steadied by a side pressure from guide blocks. (Pl. II, fig. 1.) Then an improvement was made by straining the saw between stirrups in a frame or "gate," the pitman being attached to the latter. (Pl. II, fig. 2.) As the turbine was then unknown, power was obtained from a single overshot water-wheel. (Pl. III.)

Many of the first sawmills were built in combination with gristmills, often under the same roof, the power being used to drive them both or singly, as needed.

For the next hundred years after the founding of the colonies at New Amsterdam and Fort Orange (Albany) the settlement of the State was confined to the region of the Hudson and Mohawk valleys. The development of the country and growth of the lumber industry were slow compared with the progress which succeeded the Revolution. There being no means of transportation except in the river districts, the lumbermen, after supplying local demands, had to depend on the

[a] Colonial Documents, Vol. III, p. 825.

export business, which was confined largely to the English trade. There was a market for large white-pine masts and ship-timber, which gave employment to axmen and raftsmen to some extent. But even at the close of the Revolution four-fifths of the State was still an unbroken wilderness, and where the large and populous city of Rochester now stands there was not a house or a white man to be seen one hundred years ago.

Except in the Hudson and Mohawk counties settlements and lumbering operations were not commenced earlier than one hundred and twenty-five years ago, while throughout a very large area nothing was attempted until a much later date. (See Appendix and map.) But it is interesting to notice, as at New Amsterdam, how soon the sawmill everywhere followed the first cabin, how quickly the lumber industry began in each pioneer settlement, and how closely it was associated with the development of the country.

THE FIRST LUMBER SHIPMENTS.

The lumbermen of the New Amsterdam colony were not confined to the home market afforded by their fast growing town. They shipped part of their product to England, for at that time, there being no sawmills in Great Britain, all of the lumber used in that country was brought from Holland or made by hand sawyers at home. In fact, the colonists sent some lumber to Holland in 1626, three years after the first shipload of immigrants arrived. At first it was their only article of export besides furs. This consignment in 1626 consisted of "considerable oak timber and hickory," and was sent over in the good ship *Arms of Amsterdam*.

In 1675 the ship *Castle* carried a cargo of timber, valued at £400, from New York to England.

In 1686 Governor Dongan, in a report to the home government, offers to "send over boards of what dimensions you please," adding "three-inch planks for the batteries cost me fifteen shillings the hundred feet." Surely the lumbermen of New York belong to an honorable as well as ancient guild.

THE LUMBER MARKET A CENTURY AGO.

In 1801, according to the younger Michaux, the White Pine that was cut along the shores of Lake Champlain was carried to Quebec by the Sorel and St. Lawrence rivers. He further says:

> What is furnished by the southern part of the lake is sawn at Skenesborough,* transported seventy miles in the winter on sledges to Albany; and, with all the lumber of North River, brought down in the spring to New York in sloops of 80 or 100 tons, to be afterwards exported in great part to Europe, the West Indies, and the Southern States.

*Whitehall.

The same author, in writing about the lumber market at that time, says:

The White Pine is found there in the following forms: In square pieces from 12 to 25 feet long, and of different diameters; in *scantling*, or square pieces 6 inches in diameter for the lighter part of frames; and in boards, which are divided into *merchantable* or common, and into clear or picked[a] boards. The merchantable boards are three-fourths of an inch thick, from 10 to 15 inches wide, from 10 to 15 feet long, and frequently deformed with knots; at New York they are called Albany boards, and are sold at the same price as at Boston. The clear boards, formed from the largest stocks of the Pumpkin Pines, are of the same length and thickness as the first, and 20, 24, and 30 inches wide. They should be perfectly *clear*, but they are admitted if they have only two knots small enough to be covered with the thumb. This wood is also formed into *clapboards* and *shingles*.

PRIMITIVE METHODS.

At the beginning of the last century there was a lack of the tools and labor-saving appliances which are considered indispensable to-day in the lumber business. Even the ax of the chopper was homemade—a single bit with a curved hickory handle, the rude handiwork of the nearest blacksmith; for the ax factories were yet to come, and the double-bitted ax had not been invented. Crosscut saws, which had to be imported from England, were scarce and costly; hence the tree trunks were cut into logs by chopping instead of sawing. The millwrights were not much better off for tools. The first mill in Rensselaer County was built in 1792, by a man named Cross, who "had no tools but an ax, saw, and auger."

Skidways were rarely made, except where a stock of logs was left lying in the woods, the logs being usually hauled directly to the mill. Oxen were used for the most part in logging, the same teams being employed on farm work part of the year; for the lumberman was also a farmer.

There was no river-driving then. The great White Pines stood close around the mill itself, and so thickly that the logs were quickly and easily "snaked" there. The old-fashioned one-saw mill did not require much timber to stock it; hence several years would elapse before the haul became too long to be profitable. Then the lumberman would move his mill into another tract of timber and resume logging. It was not until years later that the Fox Brothers, the pioneer lumbermen of Warren County, conceived the plan of driving the logs to the mill instead of moving the mill to the logs, and so sent the first log drive down the Schroon River branch of the Upper Hudson.

There were timber thieves in those old days as well as now. Mr.

[a] "Pickings" still forms one of the well-known grades made by the lumber inspectors in the Albany market.

Nathan Ford, the pioneer of Ogdensburg, in a letter to Samuel Ogden, December 27, 1799, wrote:

There are several persons now cutting timber upon the two upper townships. Mr. Wilkins took down the names of several who pretended to settle; their motive was only stealing off the timber. If something is not done about this business, great destruction will arise. An example ought to be made, and this can not be done without sending an officer from Fort Stanwix. They have got the timber so boldly that they say there is no law that can be executed upon them here.

But if there were thieves, there were likewise foresters to look after them. In 1770 Adolphus Benzel, son of Archbishop Eric Benzel, of Sweden, was appointed inspector of His Majesty's woods and forests in the vicinity of Lake Champlain, at a salary of £300 per annum. His residence was at Crown Point.[a] As early as 1700, Lord Bellomont, governor of New York, recommended that each person who removed a tree should pay for planting "four or five young trees;" that no tree should be cut "that is marked for the use of the Navy," and that no tree or trees be cut "but when the sap is in the root."[b]

A DANGEROUS LIFE.

The life of the pioneer woodsmen was always beset with dangers peculiar to their work. Early town records make frequent mention of fatal accidents which befell them. It is remarkable how often the first death in a settlement was of some man killed by a falling tree,[c] of one who was crushed by a load of logs, or killed in his sawmill. Not only the pioneers, but their successors, have contributed to the same death roll every year. The causes are various: A heavy limb falls, broken by the wind; a tree "lodges," and, springing back from the stump, kills the axman; a load of logs "shoves" the team down some steep grade in the road, and the driver is thrown underneath or dashed against a roadside tree; a tier of logs starts suddenly; a jam on the log-drive breaks without warning; a man while fighting a forest fire finds his retreat cut off; another disappears in the current of the spring flood, and in the mills men fall upon the saws.

Accidents, painful but not fatal, also happened in the lumber woods. It is written in the records of the town of Middlebury, Wyoming County, that—

In May, 1817, Artemas Shattuck went into the woods to chop. While cutting off a log that had been partially split open, his foot was caught in the crack, and he hung for a long time suspended by his foot and partly supported by one hand. Despairing of receiving aid, he finally unjointed his ankle with his pocketknife, made a crutch of a crooked stick, and started for the house.

Their privations had a pathetic side also, for we read in the history of the town of Verona, Oneida County, that "the first death in the settlement was that of a child who was buried in its cradle for want of a coffin."

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[a] History of the town of Queensbury. By A. W. Holden, M. D.

[b] Colonial Documents, Vol. IV.

[c] In the footnotes appended to the town histories in Hough's Gazetteer of New York there are twenty-one instances mentioned in which the first death among the settlers was caused by the falling of a tree.

RAFTING.

The local market of each mill was limited to the distance which the sawed lumber could be transported on wagons, over soft, newly built roads; no canals or railroads extended these limits. The greater outside market could be reached only by rafting the product and floating it down to the towns and cities, which were always located on some waterway. Hence, the mills were erected on the upper waters of creeks or rivers, which furnished at the same time water-power and an outlet to market. Every lumberman was a raftsman as well as a log jobber and mill owner.

Passing by the lumber operations during the first century of colonial life, of which there is now very little record, we come to that period in the history of the industry in the several counties which was marked by the running of the first rafts.

PIONEER RAFTSMEN.

Arthur Noble, proprietor of the Arthurboro and Nobleboro Patents, Herkimer County, built the first mill in that county in 1790. The first lot of lumber sawed in this mill was rafted down West Canada Creek, thence down the Mohawk to the Cohoes Falls, and then carted to the Hudson River at Albany, where it was loaded in sloops and shipped to Ireland.

In Broome County, in 1796, Edward Edwards built a sawmill on the Onondaga stream, at a place which is now in the town of Lisle. He was the first man to run a raft down the Chenango River. For sixty years after the first settlements the staple product of this county was white-pine lumber, which was rafted down the Susquehanna, sometimes to Norfolk, Va. The young men had not seen the world until they had made this trip. It was a life of adventure. The river journey brought to their view whatever there was of civilization at that period, and running the dams was perilous work that furnished material for thrilling naratives on their return. Other business as well as the lumber industry was dependent on the success of the raftsmen, and notes were made payable "when the rafts get back."[a]

In Delaware County, Jesse Dickinson, who, about 1788, built a mill on Trout Creek, in the town of Tompkins, ran the first raft that went down the West Branch of the Delaware River, the lumber being floated all the way to Philadelphia.

In Chautauqua County the first lumber floated down the Allegheny River was sawed at the mill owned by Dr. Thomas R. Kennedy, on

[a] In the town of Franklin, Delaware County, a large willow tree formerly stood in the highway near the house of Judge Wattles. It grew from a cane used by Judge Wattles in walking home from Philadelphia after "going down the river" upon a raft in the spring.

the Connewango Creek, in the town of Poland, near Jamestown. This mill was erected in 1805, and by rafting the boards in the Connewango, a tributary of the upper Allegheny, the product was taken to Pittsburg, the nearest market.

In Cattaraugus County the first lumber was rafted down the Allegheny River in 1807. The rafts were owned by Bibbins Follett, Jedediah Strong, and Dr. Bradley. The first sawmill in this county was built in 1801 at South Valley by the Quaker colony, and the lumber for the first raft may have been put in the river there, although in 1807 there were mills at Olean and Portville.

Every navigable river in the southern part of the State has been utilized at one time or another by lumbermen. Board rafts, bound for tide water or "tide," could be seen on the Chemung and Tioga rivers as late as in the sixties, and on the upper Allegheny they were a prominent feature of the lumber business until the construction of the railroad along the river shore from Pittsburg to its headwaters in Cattaraugus County, N. Y. The last of them went down the river about 1890.

RAFTING ON THE UPPER HUDSON.

The Hudson River was never used by raftsmen below Albany; for a raft could make no progress unless both wind and tide were favorable. The lumber was therefore carried in sailing vessels from Albany to New York or to the old country.

Mrs. Grant[a] in describing rafting on the upper Hudson, in 1768, says:

> It so happened that the river had been higher than usual that spring, and, in consequence, exhibited a succession of very amusing scenes. The settlers, whose increase toward Stillwater had been for three years past incredibly great, set up sawmills on every stream, for the purpose of turning to account the fine timber which they cleared in great quantities off the new lands. The planks they drew in sledges to the side of the great river; and when the season arrived that swelled the stream to its greatest height, a whole neighborhood assembled and made their joint stock into a large raft, which was floated down the river with a man or two on it, who, with long poles, were always ready to steer it clear of those islands or shallows which might impede its course. There is something serenely majestic in the easy progress of those large bodies on the full stream of this copious river. Sometimes one sees a whole family transported on this simple conveyance; the mother calmly spinning, the children sporting about her, and the father fishing at one end and watching its safety at the same time. These rafts were taken down to Albany, and put on board vessels there for conveyance to New York; sometimes, however, it happened that, as they proceeded very slowly, dry weather came on by the time they reached the Flats, and it became impossible to carry them further; in that case they were deposited in great triangular piles opposite our door. (See Pl. IV.)

The greater portion of the pine on the slopes along Lake Champlain was sent to market in rafts, through the lake and down its outlet—the Sorel River—to Canada, whence it was exported to England.

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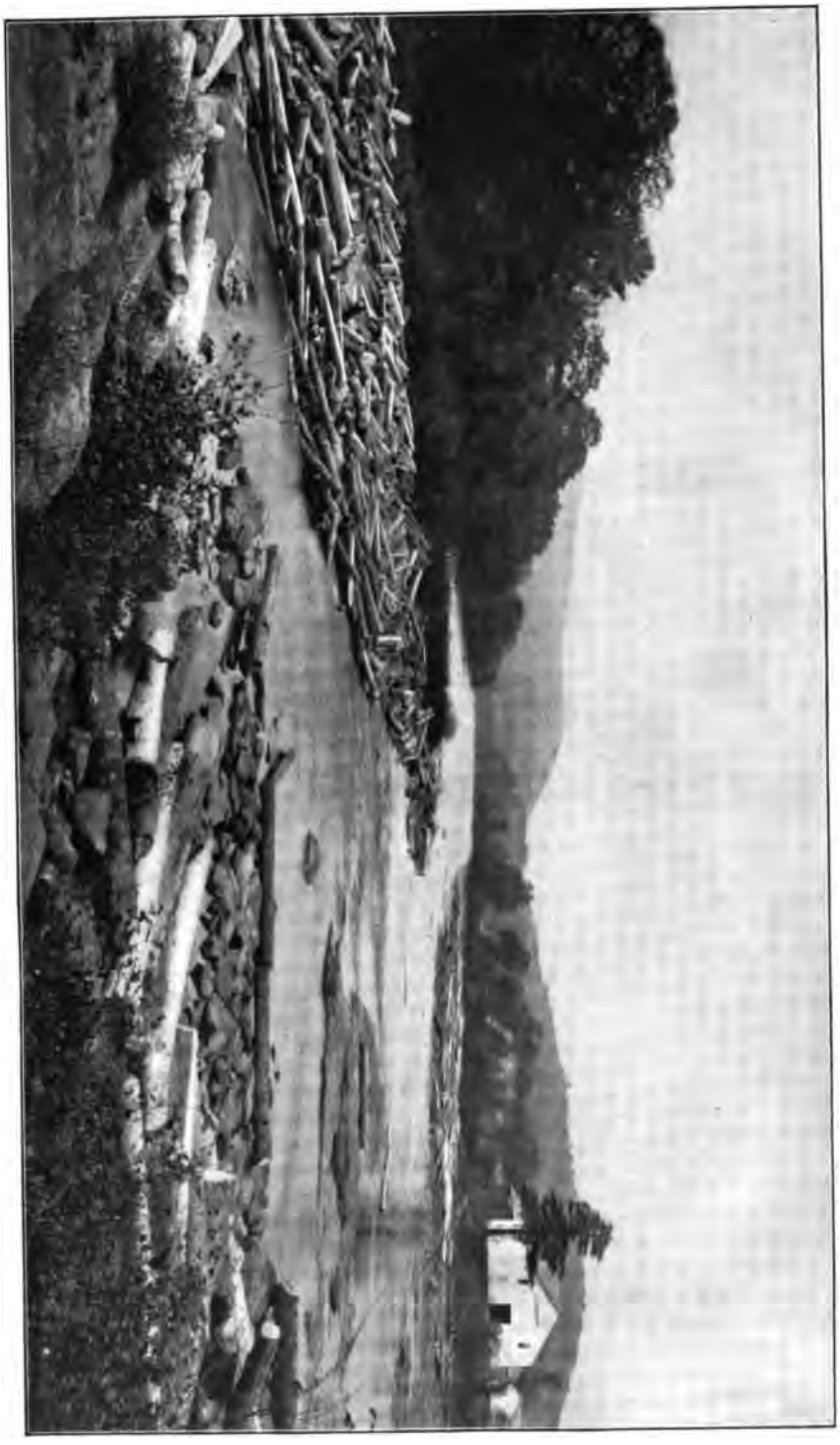
[a] Memoirs of an American Lady. By Mrs. Anne Grant. Albany: Joel Munsell, 1876



LOGS LEFT IN THE HUDSON RIVER AT LOW WATER.

In 1808, owing to international disputes, Congress laid an embargo on all trade with Canada. This restriction bore heavily on the lumbermen of Clinton County, who were dependent on the Canadian market. That year a large timber raft, said to have been a quarter of a mile long, lay at Isle la Motte waiting for a favorable wind to carry it over the line. The United States revenue officer, supported by a company of militia, was watching it, under orders to prevent any export of that kind. The bold raftsmen, undaunted by the display of military, pushed out into the stream, the soldiers following along the shore. After a brisk exchange of musketry and rifle shots, in which no one was injured, the lumbermen crossed the line and proceeded on their way without further hindrance.

CONSTRUCTION OF RAFTS.

No history of the lumber business in this State would be complete without some description of the construction of a raft. In 1865, and for several years subsequent, the writer was engaged in rafting on the upper Allegheny, both boards and square timber, putting in his rafts at Olean, Weston's, and Portville, in Cattaraugus County, N. Y., and running them to Oil City, Pittsburg, and Cincinnati. The details of the business, its varied scenes and incidents, are easily recalled to mind.

Board rafts, pine or hemlock, were from 24 to 30 courses deep, a "course" consisting of inch "stuff," or its equivalent in plank or joist. The number of courses varied according to the height of the "fresh" and the judgment of the pilot, on whose ability to handle the raft amid bars and shoals the owner was dependent for a successful and profitable trip. In that part of the State all logs were cut 16 feet long, except a small number of twelves, which were cut when necessary to save timber. Hence the platforms of a board raft were 16 feet square. They were built up in successive layers, the boards in each course being laid at right angles to those just below, thus binding them together securely.

At the corners of each platform, and at intervals along the four sides, round wooden stakes, about 2 inches in diameter, extended from the under side of the raft to the top, passing through augur holes in some of the boards. These "grub stakes," as they were called, were made of sapling trees peeled and cut away at the roots until only a knob remained at the lower end, which was larger than the augur hole in the boards above it through which the stake was passed. The binding boards in the top course were wedged solidly at the augur holes, so that the stakes could not pull out. Five platforms thus constructed were connected closely, forming a "five-platform piece." The larger rafts were made up by coupling three of these five-platform pieces side by side and fastening three more behind them. A raft of this size would then be 48 feet wide and 160 feet long; and if

it had twenty-five courses it would contain over 180,000 feet of lumber, board measure.

The greater part of this floating mass was submerged, the top course being from 6 to 8 inches above water. Occasionally a "deck load" of shingles or dressed lumber was carried on top; but the latter was not taken unless the owner intended to peddle it out along the river at places where there were no planing mills. (Pl. V.)

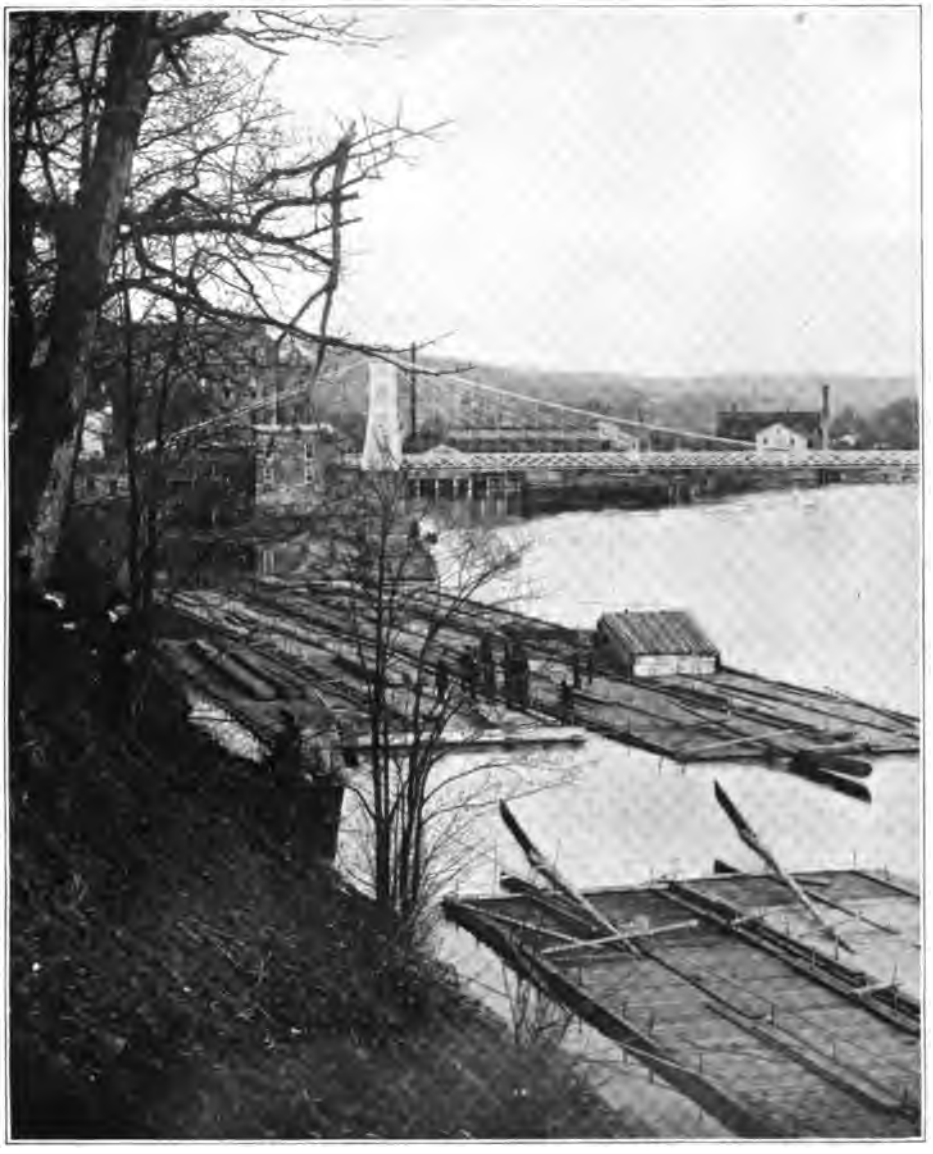
At the forward end of each five-platform piece was a large oar. On a raft such as just described there were three oars in front and three behind—not on the sides, but at the ends, projecting forward and backward. The oar blade was a 14-foot plank, 12 inches wide, thin on the lower edge; the oar, made from a small tree, was about 18 feet long and 8 or 10 inches in diameter at the large end, where it was attached to the blade. It was hewed tapering to the small end or handle at which the men stood. So large and clumsy were these rafting oars that two, and often three, men were necessary in handling them. When not in use the oars rested on the raft with their projecting blades just clear of the water. At the command of the pilot the blades were dipped by raising the handles high, and then the men pushing on the oars with hands lifted above their heads, tramped across the platform, bracing their feet against cleats nailed on the pathway for that purpose. The oars were used to move the raft sideways and keep it in the current; or, in turning sharp bends in the river, to swing it on its center by "crosspulling," in which the oars at the two ends were worked in contrary directions.

The work of the men was directed by a pilot, whose long experience had acquainted him with the rocks and bars and taught him how to take advantage of the swirling current or to avoid its treacherous force. As a large raft had six oars—three in front and three behind—a full crew required from 12 to 18 men, not including the pilot and the cook.

A shanty was built on one of the forward platforms, around the sides of which there were bunks in triple tiers. For bedding there was plenty of clean straw and coarse, warm blankets. A fireplace for the cooking was made just outside the cabin by placing four short boards on edge and filling the square with earth.

RAFTING ON THE ALLEGHENY.

On an ordinary flood the rafts would run from 40 to 50 miles each day. At nightfall the pilot would always swing in to the bank in some eddy, throw a cable ashore, and, with a turn or two around some large tree, "snub" the raft until its momentum was slowly overcome. Yielding to the crew, he generally tied up near some town or village where there were plenty of other rafts and company for the men in the



BOARD RAFTS ON THE UPPER ALLEGHENY, TIED UP FOR THE NIGHT IN AN EDDY.

tavern; there the question as to who was the best man and all other disputes were duly fought out. The Allegheny raftsmen were a stalwart type, many of them Indians from the Salamanca Reservation; and among them were not a few "bad" men, as they are termed in modern slang. After receiving their pay at Pittsburg, they generally walked home to Cattaraugus County, some of them doing easily 40 miles or more a day.

It was a pleasant, jolly, outdoor life, floating down the river through the forest-covered hills and mountains of the Alleghenies, gliding past the clearings and cabins of pioneer farmers, and running through villages or cities where the bridges were lined with people waiting to see the rafts go by.

Sometimes the raft carried one or more passengers—friends of the owner or pilot—people who were content with the plain fare and food provided.

But rafting had its trials and perplexities. Although the river dams were built with chutes or aprons to facilitate the passage of rafts, sometimes the long, floating mass would swing in the wind and current and "saddle bag" on the head of the bar below the dam. Then the boards had to be "rafted over," occasioning a delay which, on a fast falling freshet, often resulted in getting "stuck" again on some shoal farther down the river. There the raft would lie all summer, the lower courses filling with mud and the top course warping in the sun.

Bridge piers were always a source of danger, especially where there were three or four in close succession, as at Oil City and Pittsburg. Years ago the raftsmen delighted in telling the story of a Susquehanna pilot who said that there were 30 piers in the Columbia bridge, and he "run 'em all but one." The Susquehanna was a much more difficult river for rafting than the Allegheny—higher dams, more bridges, larger rocks, and more shoal water.

Many old-time lumbermen claimed that rafted lumber was better than any other, because the soaking of the boards so diluted the sap and resinous matter that when piled again in the yards it would season better and quicker. But any advantage thus gained was more than offset by the wet, muddy condition of the boards as they came from the river. Each course had to be scrubbed with a broom, and even then the front of each pile in the lumber yard was plastered with the mud scraped off as the boards were drawn up over the edge. Then, again, when the dried lumber was sent to the planing mill it was covered with a thin coating of dirt and grit that dulled the planer knives and filled the mill with a cloud of fine dust.

Hewed timber was also rafted to market. Fifty years ago most of the long timber was hewed instead of sawed, for the mills had no appliances then for sawing long sticks. Moreover, the hewed timber

was thought to be more valuable; it was stronger and would last longer than sawed timber wherever it was used. The sticks were of White Pine, ranging from 30 to 70 feet long and from 12 to 24 inches square. At one time considerable "square" timber, as it was called, was sent to the Albany and New York markets by canal, the rafts being made up into "lockbands" corresponding in size to the canal locks.

LOG-DRIVING.

Log-driving on the upper Hudson commenced about 1813. This idea of floating logs to mill was first used by the Fox Brothers, Norman and Alanson, in bringing their timber from the Brant Lake Tract to the mills at Glens Falls. These had previously been stocked by hauling the logs direct to the mill. Their example was quickly followed, and for seventy-five years the great sawmills at Glens Falls, Sandy Hill, and Fort Edward obtained their stock in this way, thereby centering the entire manufacturing business of the upper Hudson and its tributaries in that locality.

In time a sorting boom became necessary at some convenient place on the Hudson where the logs of the various lumber companies could be separated in accordance with the "log-marks" stamped on the ends of each log. This necessity, together with the frequent loss of stock by the breaking of poorly constructed booms in time of high water, caused the organization, in 1849, of the Hudson River Boom Association, and the construction of the "big boom" at Glens Falls. Here suitable arrangements were made for holding and sorting the logs belonging to the various mills located at or below that place.

From the books of this company it appears that in 1851 there were 132,500 "market" logs,* 19-inch standard, equivalent to 26,500,000 feet B. M., received at this boom. The next year 69,080,000 feet of logs passed through. These figures show approximately the extent of the lumber business on the upper Hudson at that time.

The business increased yearly until the maximum was reached in 1872, when 1,069,000 standards, or 213,800,000 feet, were handled at this point. At that time lumbermen were not cutting below 12 inches on the stump, or nothing less than "two-log" trees. Hence, the logs in the boom ran, on an average, about two to the standard, and the 1,069,000 standards delivered that year represented over 2,000,000 separate logs or "pieces."

After 1872 the business declined steadily until 1900, when the books of the boom company showed that 282,771 markets, or 56,554,200 feet had been received that year. These figures tell briefly the story of the rise and fall of the lumber business on the Hudson watershed.

*The market or standard log is 19 inches in diameter at the small end and 13 feet long.

STREAMS DECLARED NAVIGABLE.

At first the people living along the river objected strenuously to the use of the streams for floating logs to the mills. The first law declaring any river in this State a "public highway" was passed in 1806. This act provided that the Salmon River, in Franklin County, could be used for rafts and boats below Malone, and it enacted further that if any person shall "cut or fell any trees into the said river such person shall forfeit one dollar for each tree so felled and suffered to remain in the said river twenty-four hours." This same law, chapter 139, forbade any person from "rolling any log or logs into the Schroon River in Essex County, or doing anything to obstruct said river," under a penalty of $5 for each offense; but provided that nothing in the act should "prevent any person from rafting any lumber down said river they may think proper." The restrictions in this law as to obstructions will be read with interest by those who, in recent years, have noticed how many of our Adirondack rivers are filled at times for a long distance with a solid mass of floating logs through which no boat can pass.

But industrial interests are always recognized in time, and so, in 1854, the legislature declared the Salmon River "a public highway for the purpose of floating saw-logs and timber." In fact, a portion of the river was so used before the passage of this law.

In 1804 the legislature passed a law (chapter 103) to punish anyone who stole timber or lumber that was floating down the river or lying along the shore. This act refers to "any timber, hewed, sawed, or riven," terms which do not seem to include saw-logs, and which would indicate that only long timber, spars, and masts were floated down the stream at that time. Section 2 of this law provides a severe penalty for persons who shall "deface or alter any mark, or put a false mark on any such timber," from which it appears that "log-marks" were in use then, even if short logs were not driven down the stream. Nine years later a law was passed (chapter 34, Laws of 1813) requiring all log-marks to be recorded in the office of the town clerk of Queensbury, and the phraseology of this act shows that log-driving had commenced on the Hudson and "its branches to the northwest of Baker's Falls." In 1825 a similar act was passed for the protection of log-marks on the Au Sable River.

In 1810 the State legislature declared the Raquette River a public highway from its mouth to the bottom of the falls in the township of Louisville (St. Lawrence County) for rafts and boats. Chapter 264 of the Laws of 1850 declared the Raquette River a public highway for the purpose of floating logs and lumber from its mouth in the town of Massena to the foot of Raquette Lake, in the county of Hamilton.

The Black River was first declared a highway in 1821, the law pro-

viding for "rafting timber or lumber." The Grasse River was made a highway in 1824, and in 1854 an act was passed "to improve" this stream "for floating timber and saw-logs."

The years in which other rivers were delared public highways for floating logs were as follows:

Genesee River[a]	1818	St. Regis:	
Delaware River	1822	West Branch	1854
Saranac River	1846	East Branch	1860
Moose River	1851	Oswegatchie River	1854
Chateaugay River	1851	Sacandaga River	1854
Beaver River	1853	Great Chazy River	1857
West Canada Creek	1854	Deer River	1867

FLOODING DAMS.

After the merchantable timber along the main rivers had been cut lumbermen turned their attention to the more remote and inaccessible tracts on mountain slopes, where the streams were narrow, rocky, and rapid. Then commenced the erection of "splash" or "flooding" dams, which were used to drive the logs out of the small streams on the temporary, artificial floods caused by opening the gates, and also to reenforce the subsiding waters of the main stream.

These flooding dams seldom did any damage to standing timber, because the ponds were always drawn down in the early spring when the water was needed for log-driving, and the gates were left open until the next spring. There was no backflow during the period of vegetation, and the temporary flooding of the roots of the trees in the spring did not kill the timber. Trees are killed only where water is allowed to cover the ground for two or more successive summers. There is a general impression, however, to the contrary, and that the lumbermen with their flooding dams are responsible for the killing of live timber and the destruction of forest scenery. But the dead timber in the flowed lands of the Adirondacks is, in nearly every instance, the result of some dam or reservoir which was built in the interest of the State canals, local steamboat lines, or manufactories on the lower waters. The lumbermen had little or nothing to do with it.

In the southern and western portions of New York lumbermen rarely built these flooding dams. The country was not so mountainous nor the streams so rapid or violent as in the Adirondacks; the spring floods held up longer by reason of a less rapid flow, and log-driving was easier in every respect.

LOG-DRIVERS AND THEIR WORK.

The beginning of log-driving was coincident with the sudden increase in the development of the country at the commencement of the last

[a] In 1828 the Genesee River was declared a public highway from Rochester to the Pennsylvania line.

FIG. 1.—LOGS AND ICE—THE FIRST DRIVE—WEST CANADA CREEK.

FIG. 2.—LOG DRIVING ON THE AUSABLE RIVER.

century. Former primitive methods of hauling logs from the forest to the mill were no longer adequate to supply the increasing demand. The haul had become too long to be profitable, and there were no canals or railroads in those days. Hence it became necessary for the manufacturers either to move their sawmills upstream or to flood their logs down to the mills.

In a few years log-drivers were at work on every large river in the State. Logs which were cut and skidded in the fall were hauled during the winter to the shore of some stream, where they were piled in huge tiers on the "banking grounds," as they were called on the Susquehanna, or "landings" or "rolling-banks," in northern New York. With the first spring freshet, or often while the ice was still running, the blocking was knocked loose and the great piles of logs allowed to roll down into the turbid stream. When possible the logs were unloaded from the sleighs directly on the ice of some lake or stream, in order that they might go out with the ice on the first spring flood. (Pl. VI, fig. 1.)

In the lake region of the Adirondacks, river-drivers had the additional task of moving their logs through the lakes, where there was no current to assist their progress, but too often a contrary wind, that drove their logs back or scattered them. In passing through these lakes lumbermen generally rafted the logs or inclosed them in strongly connected booms, and then "warped" their way through the open water by using an anchor, a long heavy cable, and an upright windlass placed on the forward end of a strongly constructed raft. This work was often done at night, or whenever the lake was still and free from the strong winds so prevalent in early spring. Old river-drivers, in telling of the early log-drives, still describe how through the long hours and darkness they leaned wearily against the capstan bars as they tramped round and round the platform while "kedging" their way through the lakes.

The work of the river-drivers was perilous. Scarcely a season passed without someone being drowned or killed on some stream. Men were crushed under swift-rolling logs at the banking grounds, chilled to death in the icy waters, or killed in breaking the great jam which formed at every obstruction in the river. The most dangerous work was usually done by volunteers, and if all the deeds of heroism and self-sacrifice performed by river-drivers while attempting to save the life of some comrade in danger were recorded they would be found to equal anything in the histories of fire, flood, or battlefield.

The drivers were necessarily men of stalwart build and superb physique. With surprising agility they would leap from log to log while they were running down the rapid, swirling current; and, standing upright on a small log, with nothing to aid them but a pike-pole or lever, they would guide their treacherous craft as skillfully as an Indian his canoe. (Pl. VI, fig. 2.)

But the old-time river-driver is passing, and now, when the city hunter or fisherman makes his headquarters in some old, abandoned log-camp, he looks thoughtfully at the floor, thickly pitted with the marks made by the spikes in the river-drivers' shoes, and thinks of the days of the big "log-drives," while he listens to the guide who tells the story of how some "good man" met his death bravely in the white, foaming rapids on the head of the jam.

In later years, on the larger streams, the owners of the various mills usually arranged for a "union drive," the expense being shared by the log owners in proportion to the number of standards they had in the drive, this amount being determined by a tally kept at the sorting boom, or taken from the books of the log-scalers.

LOG-MARKS.

Each lumberman on the river had his own peculiar log-mark, which was stamped with a marking hammer on the ends of his logs while piled in the woods on the skidways, or before they were put into the stream. There were so many different firms operating on the upper Hudson that the ingenuity of the lumbermen was greatly taxed to devise new and distinctive marks for their floating property.

Some of the principal marks used from 1851 to 1890 on the upper Hudson and its tributaries, the Sacandaga, Schroon, and Boreas rivers, were as follows:

A Wing & Co	⊕	Bradley & Underwood	DU
A. N. Cheney	☼	Kenyon Lumber Co	⧋
Tefft & Russell	○	Orson Richards	○–○
Morgan Lumber Co	♡	Van Dusen & Crandall	☆
James Morgan & Co	⊡	Freeman & Van Dusen	⊓
Finch, Pruyn & Co	ℨ	Cheney & Armes	⊡
Morgan & McEchron	OK	Lemon Thomson	☤
W. H. Bloomingdale	X	Thomson, Douglas & Dix	Ð
D. W. Sherman	S	Union Bag and Paper Co	✠
A. Sherman	B	International Paper Co	⋋
George H. Freeman	□		

On the Tioga River the firm of Fox, Weston & Bronson used the following marks to distingnish the logs coming from their various timber tracts: ▣○△♡✕.

Other marks used on the Tioga were as follows:

Ballard & Co	⊕	Cameron & Co	㉘

On the Oswegatchie River the logs of the principal firms were stamped as follows:

Starbuck & McCarty	8	Weston, Dean & Aldrich	♡

On the Indian River (Lewis County) Roberts & Brooks used this mark: ⊹.

On the Raquette River the log marks recorded in the town clerk's office at Potsdam since 1851 included, among others, the following:

Ransom Jenkins 
A. M. Adsit & Coc 
Henry Hewett 
Hewett & Townsend 
Parmenter & Hitchings 
George L. Stanton 
Morgan, Rosekrans & Adsit 
S. Chamberlain & Co 
Hitchings & Hall 
N. Pratt & Son 
Ralph Pomeroy 
Archibald Robertson 
Ralph & Co 

George W. Sisson 
Sherman Lumber Co 
Augustus Sherman 
Burnham, Loveless & Co 
M. S. Ballard 
W. A. Griswold 
Foster & Boswell 
Harmon & Rice 
Norwood Manufacturing Co 
Watkins, Turner & Co 
Export Lumber Co 
Export Lumber Co 

In addition to the foregoing there were a large number of log-marks on the Raquette in which letters or numerals were used.

The law requiring that the log-marks on the Raquette River should be recorded was passed in 1851. It allowed the town clerk 25 cents for recording each mark. Many of these marks had been in use on the Raquette River prior to 1851. Since then 102 different marks have been recorded, the last entry having been made December 4, 1900, by the Raquette River Paper Company.

On the Saranac River there were:

Maine Company 
Christopher F. Norton 
H. & O. A. Tefft 
J. H. & E. C. Baker 
Everitt C. Baker 

Loren Ellis 
Thomas & Hammond 
Patrick Hanlon 
D. H. & W. Parsons

As the different lumber firms went out of business from time to time and had no further use for their marks, the right to use them was usually bought by other lumbermen. To reprint all the different marks used on the many logging streams would occupy too much space. Those shown here will give some idea of what constituted a "log-mark." The characters were made in different sizes, but were usually from 1 to 3 inches in length and width. In some instances numerals instead of characters were used. In selecting a design for a log-mark care was taken to choose one which would easily be recognized as the log passed through the "gap" at the sorting boom; and the men who did the marking with the hammer were supposed to hit the log in several places on each end, so that whatever side might be up as it floated through the opening some one of the marks would

show plainly above the water. The river-drivers and men at the sorting boom necessarily became very familiar with the various log marks and had their own terms for them, suggested by some resemblance. Thus there was the crow's foot, double O, wine cup, triangle, hawk eye, box, deer's foot, anchor, etc. These marks were also of use in the mill yard or piling ground, as showing the job or firm to which the lumber belonged, a part or all of the stamp showing here and there on the ends of a board or plank.

With the introduction of railroads, logging cars, steam log-loaders, and jack-works for loading logs from the lake or stream onto cars, the lumbermen are no longer entirely dependent on river-driving for getting their stock to the mill. The railroad has the advantage of being available any month of the year, and the mills are not compelled to shut down in the dry season for lack of stock. There is no loss on account of having a drive "hung up" for many months, the logs deteriorating in the meantime. With the railroad the stock can be brought to the mill just as it is required.

LOG-RAILROADS.

The first railroad for hauling logs was built in 1852 by Fox, Weston & Bronson, in the town of Lindley, Steuben County, N. Y. It was constructed of wooden rails and was equipped with platform cars and a locomotive which bore on its cab the name "Bull of the Woods." This railroad was not used as a substitute for log-driving, but for hauling logs to the bank of the Tioga River, whence they were driven to the large gang-mills at Painted Post.

Our Adirondack lumbermen were quick to perceive the advantage of using railroads for transporting timber in localities where it was not possible to drive the logs and timber to the desired point for manufacture, and there are now several timber tracts in northern New York where all the logs are taken out by rail. However, it is an unquestioned fact that water furnishes the cheapest power for moving timber, as each time the logs are handled separately, in loading and unloading, adds to their cost, and the cost of transportation by rail almost invariably exceeds that of log-driving.

The use of the railroad makes it possible to get out hardwood timber, which otherwise could not be utilized because the logs are too heavy to be floated down the stream and would sink. The hardwoods—birch, maple, Beech, ash, and cherry—constitute, on an average, over 65 per cent of our northern forest. In the Catskills they form a still larger proportion. As this class of timber becomes accessible under the improved methods of logging the value of such timber lands is greatly enhanced, and this in turn will have a direct influence on the forest policy of the State. Hitherto the State has been purchasing forest lands at a low price. The lumbermen, after removing the small proportion of conifers, were willing to sell at a low figure,

because the remaining hardwoods could not be marketed and the taxes were burdensome. But now that the hardwoods as well as the others will probably be cut there is imperative necessity for more prompt and liberal action by the State legislature if the forests are to be preserved. Hitherto lumbering has meant a culling or thinning process, the removal of the evergreens only; it soon may mean denudation.

LENGTH OF LOGS.

The lumbermen of southern and western New York usually cut most of their logs into lengths of 16 feet to supply the market demand for 16-foot boards. They also cut some 12-foot and 14-foot logs in order to save timber. But boards of the shorter lengths were somewhat unsalable. In the Adirondack forests nearly all logs were cut 13 feet long. The reason for adopting this odd length is not known now. For nearly a hundred years the lumbermen of northern New York have cut 13-foot logs, sawed 13-foot boards, and sold 13-foot lumber in the Albany and New York markets, although logs everywhere else in the United States are cut into lengths of 16 feet or some other even number. Fifty years ago the 10-inch boards, 13 feet long, from the Glens Falls mills were known in these markets as "tally boards," and were sold by count instead of measure.

LOG-RULES.

Throughout the State, with the exception of the Adirondack country, lumbermen usually bought or sold logs by one of two rules—Doyle's or Scribner's. Prior to 1850 Edward Doyle and J. M. Scribner each published an original tabulation of figures, called a log-rule, showing the number of feet, board measure, which a log of any size would yield when sawed into inch lumber. For half a century or more the relative merits of these two rules have been a source of frequent discussion, there being a material difference in the figures given by the two authorities.

It may seem strange that there should be any difference over a mathematical problem of this kind. Certainly if the saws were of the same thickness and the sawyers equally skillful there could be no variation in the results. But logs are not cylindrical; they are tapering, sometimes crooked, often rotten in spots, and apt to be defective in various ways. Hence in formulating a log-rule for general use allowance must be made for slabs, saw-kerf, waste, and various defects that may be found in almost any large lot of logs. It was on this matter of allowance that Doyle and Scribner differed.

The Doyle rule is based on a fixed, arbitrary formula, which is fairly correct as to medium-sized logs, but is inaccurate, necessarily so, as to others. Starting with the 16-foot lengths, he arrives at the number of feet, board measure, in a log of that length and of any diameter by deducting 4 inches from the diameter and then taking the square of the difference. For instance, in finding the contents of a log 16 feet

long, 20 inches in diameter, he uses this formula: $(20''-4'')^2=256$ feet. Having determined the contents of the 16-foot logs, all other lengths are computed proportionately. Hence a log 12 feet long and 20 inches in diameter would contain 192 feet, or twelve-sixteenths of 256.

Scribner arrived at his table of contents by platting circular diagrams showing the number of square-edged boards in a log properly sawed. From these diagrams the amount of lumber was computed for each diameter, after which a fixed percentage was deducted for the imperfections common to an ordinary lot of logs.

Doyle's figures for the contents of small logs are much below those given by Scribner, while in large logs he allows more than Scribner. Both rules agree substantially on logs of 24 inches in diameter, the lines crossing at this point and diverging in opposite directions. For instance:

Diameter.	Length.	Doyle.	Scribner.
Inches.	*Feet.*	*Feet B. M.*	*Feet B. M.*
10	13	29	41
24	13	325	328
36	13	832	750
10	16	36	54
24	16	400	404
36	16	1,024	923

As a majority of the trees and all top logs are less than 24 inches in diameter, the sawmill owners, being the purchasers, naturally favor Doyle's rule. When logs were bought or contracted for with jobbers at a fixed price per thousand feet, the stock cost less money by using the Doyle rule. In letting log contracts to jobbers, or in purchasing logs from outside parties, the sawmill companies have always insisted on buying, contracting, and measuring logs by the Doyle rule, as it discriminates in their favor. As a result of this discrimination the old Scribner rule has gradually been abandoned and is rarely used at present.

On a lot of straight, sound logs from 10 to 20 inches in diameter Doyle's rule would be too severe, and the contents as shown by the saw-bill would overrun the log measurement. But with a lot of large hemlock logs (which, when sawed, are liable to run largely into second quality and cull lumber, because of the shaky timber and other defects) the Doyle rule would be more advisable if the purchaser expects his saw-bill to hold out, and to have a million feet of merchantable lumber for each million feet of logs bought. A scaler who thoroughly understands his business can, however, make the proper deductions in measuring the logs.

In the Adirondack region logs are usually bought and sold by the standard, a log of certain size being adopted as the unit, which is called the standard. The standard in general use is a log 13 feet long and 19 inches in diameter at the small end. All logs are measured and compared with this standard as a unit. The method of comparison for logs of the same length (13 feet) is to divide the square of the diameter of the log at its small end by the square of the diameter of the standard; that is, by 361. The result, whether decimal or whole number, expresses the size of the log in terms of the standard as a unit. In buying and selling logs, five standards are considered equivalent to 1,000 feet, board measure.

The standard log, 13 feet long and 19 inches in diameter at the small end, contains, according to the Doyle rule, 183 feet, board measure; according to the old Scribner rule, 195 feet. But it has repeatedly been proven by tests that a sound, straight, standard log, carefully sawed with a band-saw, will yield 200 feet, board measure, of straight-edged boards; and this is the assumption of the Adirondack lumbermen, who, in handling logs, speak of five standards as being equivalent to 1,000 feet.

In the Saranac region lumbermen formerly used a log 22 inches in diameter at the small end as a standard unit of calculation.

When speaking of the 19-inch standard, lumbermen often make use of the term "market" instead of standard, and speak of 20,000 standards as 20,000 markets, meaning 20,000 marketable logs; although, if the timber is small, it might take 60,000 separate pieces to actually scale 20,000 standards, or markets. The Adirondack lumbermen always estimate five 19-inch standards, or markets, as being equal to 1,000 feet of logs, board measure; hence a log-job or drive of 50,000 standards may be regarded as equivalent to 10,000,000 feet, board measure. These figures will be more easily understood by an outside lumberman. The idea of buying and selling logs using some certain size as the fixed standard originated with Norman Fox, a pioneer lumberman of Warren County.

The methods and rules for the measurement of logs have never been made the subject of any legislation in New York State. Laws have been passed, however, providing for the appointment of a certain number of inspectors and defining the number that may be appointed in each of the various districts into which the State has been divided for this purpose. In 1805 an act was passed for the inspection of lumber, rafts, timber, and spars, which allowed the inspectors to charge 37½ cents per M, B. M., and 14 cents per 40 cubic feet. The inspectors were required by this law to mark all lumber or timber which they had inspected with a "marking iron," showing the number of feet in each piece.

MODERN SAWMILLS.

The first sawmills in each locality throughout the State or colony were of a primitive character, containing one upright saw for which the power was furnished by an overshot water-wheel. In time an additional saw was inserted in the gate, and so on until the modern gang was evolved. (Pl. VIII, fig. 1.)

The first gang-mill was built on the Hudson River at Fort Edward; just when, the records do not show. It is asserted that the next one was erected in 1848 by Hinckley & Ballou, on West Canada Creek, in the town of Russia, Herkimer County, but prior to this year there were gangs running in the mills at Glens Falls, Sandy Hill, and Painted Post.

In 1848 Henry S. Shedd and Marshall Shedd, jr., erected a gang-mill in Lewis County at the lower falls of the Moose River, about 1 mile from its junction with the Black River. The gang in this mill contained 32 saws.

The first gang-mill on the Raquette River was built at Norwood, in 1851, by Morgan, Rosekrans & Adsit.

For many years after their introduction sawmills were operated by water-power exclusively. Their owners, having secured the best mill-sites on our rivers, did not need to run their mills by steam. Water-power was cheaper, and many of the largest gang-mills in New York use it to-day.

The large mills have not changed materially in the last forty years. In 1860 there were several in New York that ran five or six gates; say three gangs, a slabbing gang, and two English mills.[a]

Some used a Yankee gang instead of a slabber, and in the large mills, where two or more stock gangs were in use, one of them would contain about 36 saws, set for inch boards, while another would be hung with a smaller number, set for plank. Such a mill—six gates—would cut about 15,000,000 feet per year, running night and day, with an occasional shut-down for low water.

Steam mills as a class used a large circular saw (Pl. VII, fig. 2), although of late years there are mills in New York, as elsewhere, which run both circulars and gangs, to which band-saws have recently been added. (Pl. VII, fig. 1.) It is difficult to find any records showing when the first steam sawmill was built in New York State. A sawmill driven by steam power was built in 1830, in the town of Newark Valley, Tioga County, by Chester Patterson and Jonathan Day, which employed about 30 men. The engine had a walking beam, such as is used on steamboats.

In 1833 George Kirby erected a steam sawmill in the town of Nichols, Tioga County.

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[a] The English mill is an ordinary square gate or frame containing one or two upright saws, with a 16-foot carriage that gigs back.

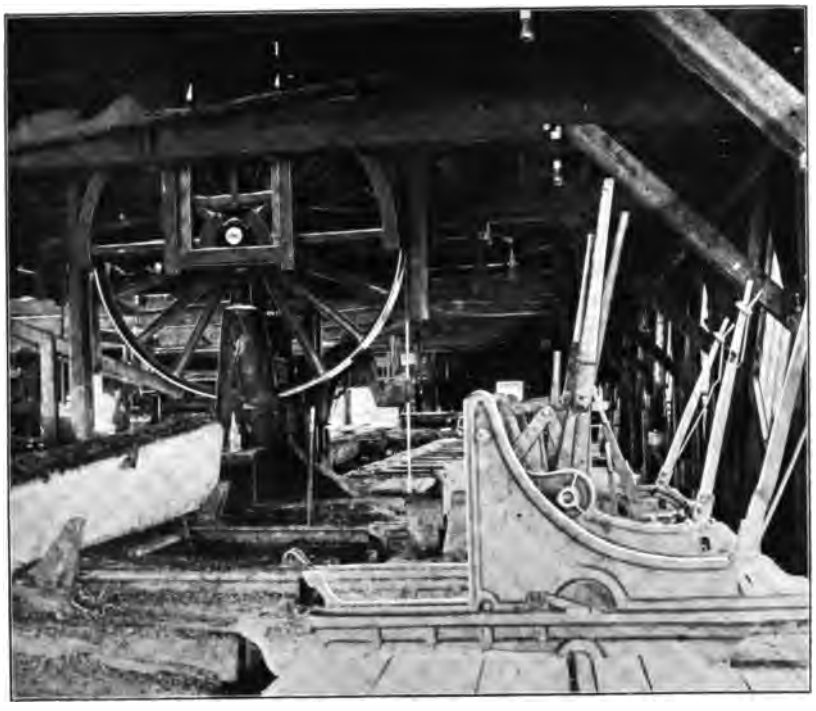


FIG. 1.—MODERN BAND SAW, TUPPER LAKE, N. Y.

FIG. 2.—CIRCULAR SAW, TUPPER LAKE, N. Y.

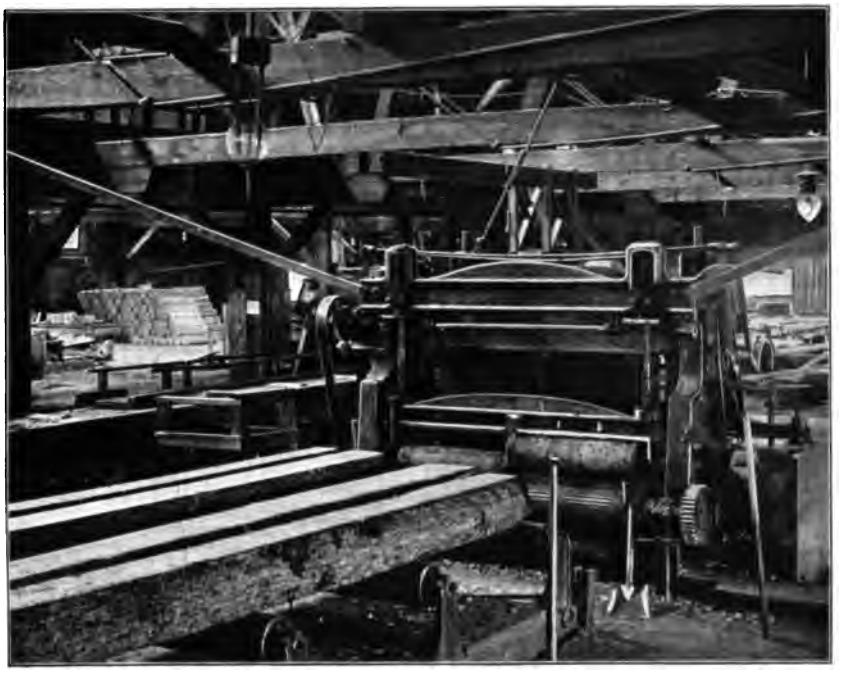


FIG. 1.—MODERN GANG SAW, TUPPER LAKE, N. Y.

The largest mill in the State, operating two gang saws, two bands, and two circulars.

FIG. 2.—JACK LADDER, WITH ENDLESS CHAIN.

In 1842 Dexter and Daniel Davis built one in the town of Caton, Steuben County. In 1844 a steam sawmill was erected in the town of Hammond, St. Lawrence County, by James E. Lyon. The first steam mill in Erie County was built at Tonawanda in 1847 by Col. L. S. Payne. In 1849 one was started by Kitts & Broadway in the town of Denmark, Lewis County.

TANNERIES.

Although the lumberman has little in common with the tanner, the demands of the latter had a material influence on that part of the lumber industry which belonged to the hemlock trade. To-day hemlock lumber finds a ready market, and at a price equal to that paid for spruce not many years ago. But a large portion of the Hemlock in this State was cut to supply the demand for bark only, the logs being left in the woods to decay and waste. This was particularly the case in the Catskill counties, where this species was more abundant than elsewhere in the State. Only the most accessible of the timber was hauled to the mills.

Bark-peeling in the Catskills ceased prior to 1870, and the great tanneries at Phœnicia, Woodland, Shandaken, Big Indian, and Prattsville had to abandon their business for lack of bark. The tannery at Prattsville, owned by Zadoc Pratt, was one of the largest in the State. Here 60,000 sides of sole leather were tanned and 6,000 cords of bark consumed annually for twenty-five years. Over 6,000,000 feet of hemlock was cut each year to furnish bark for this tannery alone, the greater part of the logs being left to rot after they were peeled.

The principal men in the tannery business in the Catskill region were Col. H. D. Snyder, Phœnicia; James Simpson, Phœnicia; Pratt & Sampson, Shandaken, and Zadoc Pratt, Prattsville. In 1865, according to the State census, there were 820 tanneries in New York; to-day there are not a dozen all told.

METHODS OF LUMBERING.

The present system of logging and lumbering has been evolved from the knowledge and experience gained by lumbermen in the early years of the industry. Many improvements have been made in tools and mechanical appliances; men are now better housed, fed, and paid; but the general principles, on which the business is conducted to-day, remain the same as in the days of the pioneers. Hence a description of the manner in which the work is conducted at the present time will give some idea of the methods employed a century ago.*

*A good description of life in the lumber camps as it existed many years ago may be found in the interesting volume, Forest Life and Forest Trees, by John S. Springer. 1856. New York: Harper & Brothers.

The experienced lumberman usually prefers to run his own camps, hiring a foreman to look after the work during his temporary absence; but a large portion of the timbering to-day is done by jobbers under contract. For example, a lumberman, landowner, or sawmill man, as the case may be, decides to lumber some certain tract. He lets a contract to cut the logs of a particular species on the tract, and deliver them to some point on a railroad, or on the banks of some stream, or upon some lake, whence they can be floated to the mill. This is called letting a log-job, and the man who contracts to do the work is called a jobber. In some places the contract is let by the thousand feet; in the Adirondacks it is usually let by the standard. The agreement is usually written in duplicate and signed by both parties.

The jobber commences operations by the erection of his logging camps, which are located on the tract in the most advantageous positions for removing the timber which is to be cut. The "bodies" of the camp are usually made of long logs, or sticks of timber rolled up and "notched" at the corners to hold them firmly in place. The cracks between the logs are firmly chinked with moss to keep out the cold. The roof is usually constructed with small pole rafters, covered with boards, these being covered with heavy tar paper. If the camp is to be used for several seasons, they sometimes shingle it with a cheap grade of shingles. A "tote" road is cut through the woods to the camp-site, over which the necessary boards, supplies, etc., are hauled. Bunks, tables, and partitions are constructed of rough boards. In early times no floors were laid, the earth being leveled off for that purpose. At the present time nearly all camps have floors made of boards or logs flattened. On the larger jobs the camps are built to accommodate from 80 to 100 men.

There is generally one large building, with an attic fitted up with tiers of bunks for a sleeping room, the ground floor containing the cook room and dining room combined, fitted up with long board tables on which the meals are served. (Pl. IX.) One end of this room is partitioned off for a "men's room," where the crew sit evenings, smoking, reading, singing, grinding their axes, telling stories, etc., before climbing the ladder to their night's rest in the bunk room. (Pl. X.) In many Adirondack camps at present they have a man cook, with an assistant known as the "cookee." But for many years women have been employed in camps as cooks, hence the name "men's room," for the crew are not allowed in the cook room except at meal time. Another log building, one story only, serves as a barn for the horses, and as a storehouse for the hay and oats. A blacksmith is an indispensable man in a logging camp, so a log building of suitable size is put up for his use, in which are a forge and all the tools for shoeing horses, mending chains, and repairing sleds. In the larger camps where a big job is being carried on, an additional building known

THE DINING ROOM, ADIRONDACK LOG CAMP.

THE MEN'S ROOM, ADIRONDACK LOG CAMP.

as the office is erected for the convenience of the foreman, the log-scalers, and the clerk, and as a store for the sale of such necessary articles as shoes, stockings, mittens, tobacco, etc. (See frontispiece.)

The "tote" road having been put in a fairly passable condition, the jobber hauls in his stock of provisions, tools, and feed for his teams; and he is soon followed by straggling groups of hardy looking men, some of whom, having spent their previous earnings in some metropolis of the wilderness, have no alternative other than another long sojourn in the lumber camps.

If the contract of the jobber includes hemlock and bark peeling, work begins in the early summer; for the bark will peel only from May 20 to August 20, or thereabouts. In this work each man is assigned his particular task. The best axmen are detailed for the felling of the large hemlocks. Others girdle with their axes the fallen tree trunks at intervals of 4 feet, and these are followed by men with "spuds"—iron tools with which they peel or pry loose the bark. The first "ring," the one at the base of the tree, is taken off before the tree is felled; otherwise the cutting at the stump would spoil this piece of bark. Another gang works as "swampers," in piling and ranking the bark ready for hauling.

With the approach of autumn the sap ceases to flow; the bark consequently sticks to the tree, and the work of peeling is ended for the year. The lumberman now turns his attention to cutting the spruce, pine, and balsam logs, and the forest echoes with the crash of falling trees. In early years all logs were chopped, but at present, for economic reasons, it is considered far better to saw them. There are men who show wonderful expertness in cutting a stump so the tree will fall exactly where it is wanted, some of them being able to stick up a stake as a mark, and to drive it into the ground with the falling tree. Some such skill is necessary in order to prevent the tree from "lodging" in another as it falls, to avoid piling it on down timber, and to avoid breaking young and valuable trees which may be standing near.

While the sawers are busy felling and cutting up the trees into logs, others are employed in lopping off the limbs from the logs, and preparing the skidding trail for the teams that haul the logs to the skidways. (Pl. XI, fig. 1.) The men cutting off the limbs are called "guttermen;" those driving the teams "skidders." The logs are rolled into huge tiers on the skidways, ready to be loaded upon sleighs when the snow comes. (Pl. XII, Pl. XIII, and Pl. XIV, fig. 1.) The skids were formerly cut from small spruce and were left lying in the woods to decay. At present, owing to improved methods and the increased value of the timber, hardwood skids are used if practicable. Whenever necessary to use softwood skids, after the logs have been removed they are cut up into the proper lengths, scaled, and hauled to the landings.

While on the skidways the logs are measured, or "scaled," as it is termed, the "scaler" taking the diameter of each log inside the bark at the top end and tallying it down in his book, after which a man with a marking hammer stamps the logs on both ends with the owner's mark. (Pl. XI, fig. 2.) The scaler generally has an assistant, for logs in large piles must be measured at both ends in order to determine which is the top, the body of the log being out of sight. Crooked or rotten logs are cut or "docked" in measurement enough to offset the defects.

While the cutting and skidding is going on the jobber usually employs a portion of his crew building roads from the skidways to the main road, which in turn leads to the lake or river bank where the logs are to be unloaded. A diagram of the roads on a big lumber job would resemble a tree with subdividing branches, although a somewhat crooked one, owing to the curves and windings of the ravines or depressions down which the roads must go. This laying out of roads is an important part of the work, for upon the skill and judgment exercised much of the profit in the job depends. All necessary roads must be built, but unnecessary ones must be avoided. The jobber must exercise no little engineering skill in selecting a line that will reach all his skidways and at the same time preserve a practicable grade. It should be downhill all the way from the starting point, so that large loads can be hauled, and yet not so steep as to shove a team over the bank. Skill and experience are called for in the construction of side-hill or dugway roads, in bridge building, and in corduroying swamps.

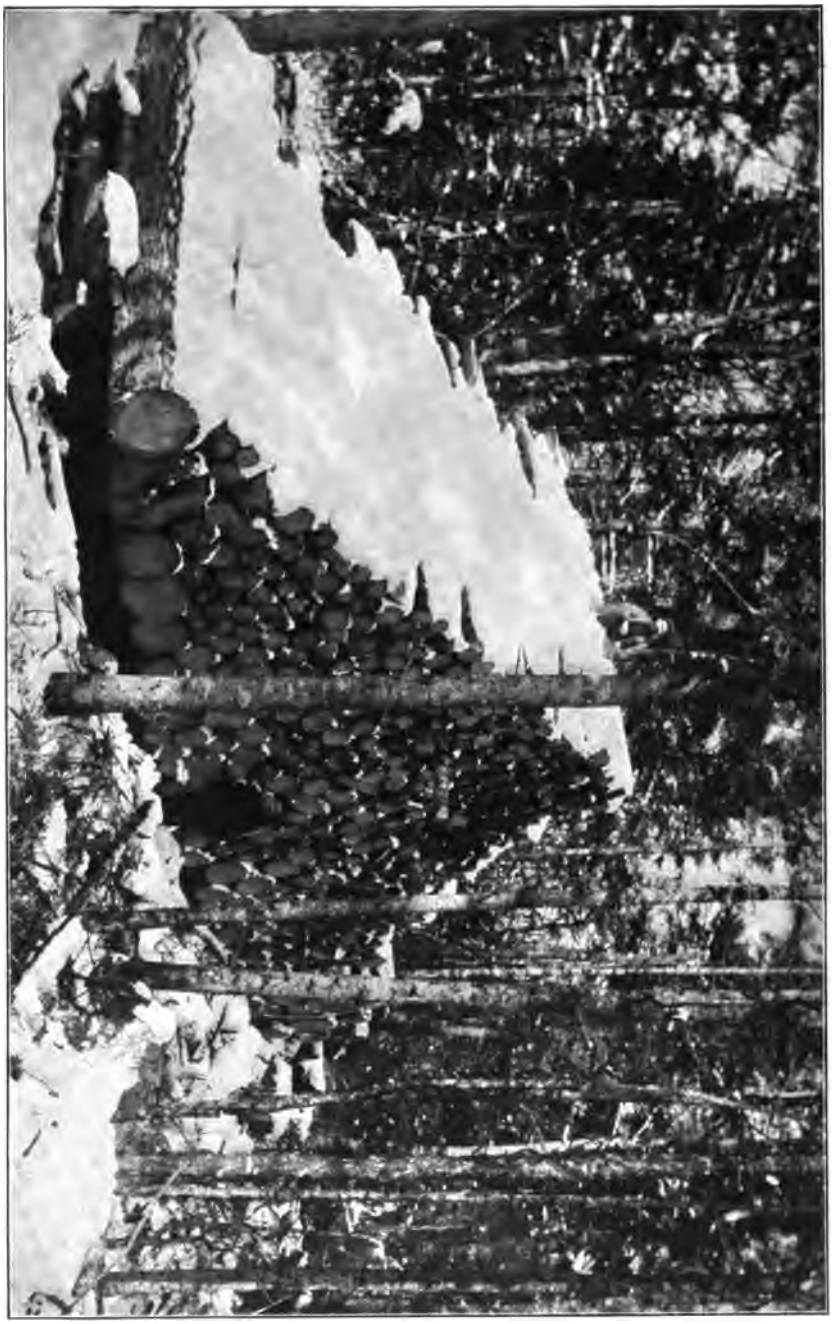
The camps having been built, the bark peeled and ranked, and the skidways piled high with logs (Pl. XIII), upon the first deep snow the hauling commences. The roads are sprinkled from a large water tank, drawn on a sleigh, until a good ice bottom is formed, while on the steep grades sand and gravel are thickly spread to retard the speed of the loaded sleighs. Soon the landing or banking ground becomes a scene of activity. Teams drive up in quick succession to be unloaded, binding chains are unfastened by the unloaders, and the huge loads roll off the sleighs with a bumping, thumping noise as the logs rebound from the frozen earth.

The teamsters vie with each other in the size of their loads; and with the wide "bunks" now in use, iced roads, and heavy teams, a pyramid of logs is rolled up on the sleigh at the skidways until the driver, astride on the top log, is perched 10 feet or more above the ground. (Pl. XIV, fig. 2.) Some of the "champion" loads contain from 5,000 to 6,000 feet, although smaller ones are the general rule. A teamster is expected to make a specified number of trips each day, according to the length of the haul, which varies in most jobs from 1 to 4 miles, sometimes more. He must needs go to sleep early, because he must be up long before daylight, feed his team, get his

FIG. 1.—CUTTING SPRUCE LOGS, HAMILTON COUNTY.

FIG. 2.—MEASURING AND MARKING LOGS ON THE SKIDS.

SKIDDING LOGS IN THE ADIRONDACK FORESTS IN WINTER.



A SKIDWAY IN THE NORTH WOODS.

FIG. 1.—SKIDDING LOGS IN SUMMER.

FIG. 2.—A BIG LOAD ON THE WAY TO THE ROLLING BANK.

breakfast, and be off on the road while the stars are still shining clear and cold in the winter sky.

The average wages paid in the lumber camps of northern New York run about $28 per month, including board, with a distinction in favor of first-class men, to whom higher wages are paid. The jobbers are quick to recognize a good hand, and a man is paid what he can earn.

With the delivery of the stipulated number of logs at the river bank the jobber has finished his contract and "goes to town" to settle up with his employer. The men have been paid off and have taken their way to their homes or to some village, where too many of them soon part with their hard-earned wages. Old grudges are fought out, and not infrequently some luckless hero of the camp spends his vacation in the county jail. But as a class they are honest, brave, and industrious, reflecting credit on the great industry with which their life and labor are so closely identified.

When the spring thaw, with its warm south winds and rains, begins to loosen the ice in the upland streams and lakes, the boss river-driver collects his crew of stalwart, daring men, and again they start for the woods, where the thousands on thousands of logs are piled ready for the spring flood. Before the ice has fairly ceased running the logs are rolled into the water and the drive is on its way. Some of the men are stationed along the shores to prevent the logs from lodging or floating into bays or setbacks; some stand at the heads of the bars or islands, where with pike-poles they shove off the logs that might stop there and form a jam; others follow at the tail or rear of the drive and clear up the shore of such pieces as may have drifted out of the current and been left behind. Then there is the cook, most indispensable of all, who follows in the rear along the bank, pitching his tent from time to time in convenient places where the hungry crew can get their meals. (Pl. XV.) When the freshet is subsiding and the water falling rapidly so that the logs stick on every bar and along the shore, a splash dam is opened, and with the oncoming flood the work is resumed with all its interesting, active scenes.

At times, in some crooked, rocky stream, a jam is formed and thousands of logs are wedged fast in the channel, held back by some one log firmly braced against an impediment. Then occurs a thrilling scene as the foreman calls for volunteers to break the jam. There is always a prompt response. Two or more daring fellows, impelled by pride in their work, take their lives in their hands, and, with an ax and handspikes, make their way over the treacherous logs to the head of the jam. Behind them are thousands of logs, filling the angry stream from bank to bank, piled thickly to the bottom, in all shapes, tossing, tumbling, and leaping in the air as the dammed-up torrent forces them about in wild confusion. Beneath the men is the swaying, rocking, unstable mass, somewhere in the midst of which is the log

which forms the key to the position. The balance of the crew of drivers gather on the bank below, where they watch with intense anxiety the men who have volunteered to break the jam. They note every motion of the volunteers as they coolly and undauntedly proceed with their work. The critical moment is close at hand. There is a little more prying with the handspikes, a few more blows with the ax, and then suddenly the huge, threatening mass begins to move. Above the sound of the foaming waters a warning shout goes up from the men standing on the bank, and then, leaping from log to log, as the jam "breaks," the brave fellows reach the shore in safety amid the applauding cheers of their comrades; or, it may be, as a cry of horror breaks from the crew, one loses his foothold and disappears beneath the terrible, grinding mass, crushed and torn to a mere semblance of humanity. His body is found later in the river below, and another chapter is added to the unwritten records of heroism to be related in the next year's camps by his former companions, who, in subdued tones, tell the story of the man who lost his life on such a stream last spring.

So amid scenes of toil and danger the work is done. The drive is safely inclosed in the big boom at the mills, and the job is completed. (Pl. XVI.)

There is probably no industry which involves so many varied details as the business of lumbering; none which requires so close attention at every stage of the work; and none in which intelligence, strict economy, and, above all, thorough experience, are so necessary to profitable results. Failures in it have been so many that no one should undertake it who has not within him these specified requisities to success.

MODERN IMPROVEMENTS.

Some of the more important changes that have taken place in lumbering methods, mainly within the last century, are worth noting.

The chopper no longer uses a single-bitted ax. The tree is sawed, not chopped, into logs of the required length. In cutting down the tree a crosscut saw is used instead of an ax. The forester in charge of the job insists that all trees be cut as close to the ground as possible to save the timber lost in a high stump. On some jobs the logs are skidded by wire ropes and steam power. Iced roads, easy grades, wide "bunks," and attention to details enable teams to haul much larger loads of logs. In some places water-slides, miles in length, render log hauling unnecessary. Logs are placed on cars by steam loaders, lifted from lakes or streams by steam jack-works (Pl. VIII, fig. 2), and taken to the mills on railroads instead of by driving down the rivers. The introduction of the planing mill[a] built up a new and distinct branch

[a]The Woodworth planing machine was patented in 1828, and the patent was extended twice.

RIVER DRIVERS, SLEEPING TENTS, AND PORTABLE COOK SHANTY.

FIG. 1.—RAQUETTE POND AND PILING GROUND.

FIG. 2.—THE REFUSE BURNER FOR THE DISPOSAL OF SLABS, EDGING, AND SAWDUST.

of the lumber business. In modern sawmills we find the oscillating gang, circular saws with inserted teeth, mechanical appliances for handling logs, live rollers. and that most profitable of all improvements, the band-saw.

Until recent years the word "forest" was seldom heard except when used rhetorically. It belonged to poetry and literature. The lumbermen and the people used the word "woods" instead. People lived in the backwoods, went into the woods, came out of the woods, or were lost in the woods—never the forest. People spoke of the North Woods, the South Woods, the "Nine-mile" Woods, and the Shattygee (Chateaugay) Woods.

But now we hear the words forest and forestry. And in chronicling the improvements in the lumber industry of New York State mention must be made of the intelligent, conservative methods recently introduced in the management of public and private woodlands by professional foresters, whose working plans insure the preservation of the forests and the perpetuation of the timber supply.

"CAPTAINS OF INDUSTRY."

In recording the rise and progress of the lumber business, some passing tribute, at least, should be paid to the memory of the men who were prominently identified with this important factor in the development of the wealth and resources of the State. They were men of both physical and mental vigor, possessed of sturdy virtues that made them respected, not only in the communities where they lived, but wherever they were known. They had a keen sense of honor and fair dealing that made them known and described as men whose "word was as good as their bond"—a common, homely expression, but one carrying praise that was well deserved. The grass has been growing on their graves for many years, but their memory is still cherished, their influence for good is still felt, and the world is better for their having lived.

Among the men now dead and gone who were prominently connected with the lumber business on the upper Hudson, mention should be made of Abraham Wing,* James D. Weston, John J. Harris, Albert N. Cheney, Lewis L. Armes, Walter Geer, Orlin Mead, George Sanford, Orson Richards, Augustus Sherman. James Morgan, Charles H. Faxon, and Lemon Thomson.

On the Raquette River: Edward King, Ralph Pomeroy, Charles Pearson, George Richards, Matthias Vickery, James H. Carpenter,

* "Mr. Wing, born in 1791, had the foresight and judgment requisite for improving the golden chance by bringing to market the splendid pines with which the great Brant Lake tract abounded. This rich and extensive lumber region, previously operated by the Fox Brothers, Alanson and Norman, had come into the possession of parties in Troy, who intrusted its management to Mr. Wing." (History of Queensbury, by A. W. Holden, M. D. Glens Falls: 1849.)

Edward W. Hutchings, Lyman H. Wilcox, Harrison Plummer, A. M. Adsit, and E. H. Rosekrans.

On the Tioga River: Deacon Simeon Hammond, Abijah Weston, William C. Bronson, William B. Stevens, Benjamin Harrower, and Julius Tremaine.

On the Saranac River: Senator Christopher F. Norton, Almon Thomas, James Hammond, David H. Parsons, Wales Parsons, Hartwell Brothers, O. A. Tefft, and Loren Ellis.[a]

In western New York: John G. Mersereau, of Portville, and the Weston Brothers, of Olean.

WOODPULP.

Within twenty years the logging industry in northern New York has been materially affected by the demand for material necessary in the manufacture of woodpulp, an industry of comparatively recent development. Ground pulp, obtained by holding blocks of wood against a grindstone, was first made in this country in 1867, at Stockbridge, Mass. Chemical mills, in which the fiber is reduced by the action of acids under steam pressure, were introduced about the same time. Now there are 293 mills, mechanical and chemical, in the United States, of which 102 are located in New York. Wisconsin comes next with 37, and Maine has 30.

At first the New York mills used poplar only. This was deemed a desirable condition by our foresters, because this species does not appear to be available for any other purpose, while at the same time it is the kind of tree with which nature most quickly reforests burned areas in the Adirondacks. But poplar was soon discarded in favor of spruce, to which have been added within the last five years some of the other conifers, the process of manufacture having been improved so that a satisfactory fiber is now being obtained from Hemlock, pine, and Balsam.

The effect on timber cutting was soon evident. Where the lumbermen formerly took nothing less than two-log trees, leaving nearly all that were 12 inches or less in diameter on the stump, the woodpulp men cut all the trees of certain species, large and small. This close cutting of spruce and other kinds left no provision for future growth, and thinned the forest so severely in places that further damage was inflicted by wind and ice storms. The river-drives, which were formerly composed of fair-sized logs, were mixed thickly with smaller logs, and on some streams where pulpwood only was being driven, the drives were entirely made up of 4-foot lengths. The methods employed in cutting pulp timber differ somewhat from those used

[a] For interesting and valuable facts relating to the history of lumbering in the Saranac Valley, see paper read by Hon. Everitt C. Baker before the Plattsburg Institute January 14, 1901, and printed in the Plattsburg Sentinel January 18, 1901.

FIG. 1.—BEGINNING OF WATER SLIDE. THE ROLLING BANK.

FIG. 2.—THE SLIDE BUILT ALONG SLANTING ROCK.

FIG. 1.—ASLEEP AT HIS POST—WAITING FOR A JAM.

FIG. 2.—A DASH.

FIG. 1.—A PLUNGE. END OF WATER SLIDE, AUSABLE RIVER.

FIG. 2.—FOUR-FOOT PULPWOOD LOGS. AT REST AT LAST.

in getting out logs for sawmills. Where no forestry is practiced, the very small trees, as well as large ones, are cut. They are sometimes sawed into short lengths of 4 feet, thus making the work of handling the timber easier, although as the logs are too small to sustain a man's weight it makes the river-driving harder. It is usually considered more advantageous to cut the timber in lengths of 12, 14, and 16 feet. If it has to be driven and sorted from other timber this is undoubtedly the best method. Formerly only the small trees and the top logs were used for pulpwood, large timber being reserved for the sawmills and cut into usual lengths; but as the demand for woodpulp increased the stumpage became more valuable for that purpose, and on some tracts all the spruce timber, both large and small, was cut for pulpwood. The largest spruce in the Adirondacks, so far as known (41 inches in diameter on the stump), was cut for pulpwood. On some pulp jobs the bark is peeled from the trees in the woods in order to save freight, and as the bark has no commercial value it is left where the peeling or "rossing" is done. A mass of dry bark-strippings, covering the ground thickly in places, greatly increases the danger from fire. Much of the pulp timber in the Adirondacks is hauled directly to some railway station, and from there is shipped to the mills, as at the present market prices it will bear transportation a long distance. In some places the pulp logs are driven down some stream into a lake or pond near a railroad, where by means of steam jack-works they are loaded on cars. In other localities a long haul by teams is dispensed with by the construction of water-slides or wooden troughs several miles in length, through which a shallow stream of water carries the sticks to the railroad or to some river, whence they are driven to the pulp mills in the same manner as in a log drive.

In the vicinity of Benson mines, St. Lawrence County, there is a water-slide 3 miles long for conveying pulpwood to the railroad. This trough is 24 inches wide at the top and 10 at the bottom, with a depth of 20 inches. It is capable of moving 60 cords per hour. The company operating this slide had at one time a pile of pulpwood 1,000 feet long, 26 feet high, and 40 feet wide, all of which had been transported from the woods to the railroad by this novel method. They had also an additional slide in which sawed lumber was transported from the mill to the railroad. The J. & J. Rogers Pulp Company, of Ausable Forks, Essex County, N. Y., have on one of their jobs a water-slide 7 miles long, by which their pulp stock is carried to the Ausable River, where it is driven to their mills. (Pls. XVII, XVIII, XIX.)

In 1898 the total cut of logs in the Adirondack forests amounted to 544,234,207 feet, of which 229,581,918 feet was consumed in the pulp mills.

A peculiar effect of the woodpulp industry is the rise in value of

spruce stumpage. This has increa ed beyond the point warranted by the market value of the sawed lumber. Spruce stumpage is now worth so much for woodpulp that the sawmill men are unwilling to pay the price demanded for the standing timber, and unless there is some change in market conditions this species will not enter so largely hereafter into building operations, its place being taken to a great extent by Hemlock or cheap pine.

VOLUME OF BUSINESS.

The lumber industry of New York attained its maximum development at some time prior to 1865, when there were, according to the State census of that year, 3,963 sawmills. Perhaps three-fourths of this number were mills equipped with one saw only, none of which cut over 100,000 feet in a year.

From the Tenth United States Census, 1880, it appears that there were then 2,822 mills in New York, with an invested capital of $13,230,934, giving employment to 17,509 men, and paying out annually $2,162,972 in wages. The combined lumber product of these mills amounted in 1880 to 1,148,220,000 feet, board measure, not including lath, shingles, and staves.

Within the next twenty years there was a great decrease in the production, the timber supply having been exhausted in the Adirondack and Catskill forests. There are not 150 mills in the State to-day with an annual output of over 100,000 feet. The production is now confined almost wholly to the Adirondack region, the mills which are stocked from there having sawed in 1899 the following amounts:

Spruce	feet B. M..	148,203,491
Hemlock	do....	46,545,772
Pine	do....	33,132,807
Hardwood	do....	24,296,554
Total	do....	252,178,624
Shingles	number..	33,619,000
Lath	do....	49,329,090

To the amount of sawed lumber should be added 195,568,623 feet of logs that went to the pulp mills, making the total forest output of northern New York that year 447,747,247 feet.

There are several small sawmills in the Catskill counties, with a few others scattered throughout the western part of the State, their combined product not exceeding 60,000,000 feet. The advocates of forest preservation and the protection of our economic resources need no better argument than is contained in the figures showing the great decline in this industry within the last twenty years.

EDITOR'S NOTE.—The author, in his report as superintendent of forests for the State of New York (contained in the Seventh Annual Report of the New York Forest, Fish, and Game Commission, Jan-

uary 30, 1902), places the output of northern New York for 1900 at 533,339,072 feet, of which 230,649,292 feet was spruce for the pulp mills; the combined product of the Adirondack and Catskill forests for the same year at 651,135,308 feet; the number of employees in the sawmills of northern New York at 8,617, with annual wages aggregating $1,846,930; the number of employees in the pulp mills at 9,382, with annual wages aggregating $3,040,478.

The preliminary summary of the Twelfth Census concerning sawmills, planing mills (operated in connection with sawmills), and timber camps, places the total amount of timber from all sources sawed in New York State in 1900 at 878,448,000 feet, and the value at $12,364,362.

PROFITS OF THE INDUSTRY.

In many localities within the State there are lumbermen who have amassed large fortunes and attained prominence on account of their wealth. Their well-known success has created an impression that the lumber business is an exceptionally profitable one. This, however, is not the case. There is very little money in buying logs, sawing them, and marketing the product. The rich lumberman, in almost every instance, owned large tracts of timber land, and his wealth represents the appreciation in value of this kind of property; in his ordinary business—that of the logging camp and sawmill—he made a fair living profit, and nothing more. People seldom make much money in log jobbing or in sawing "custom logs." The lumbermen who owned no timber lands, and had to buy their logs or stumpage, were obliged to do business on a narrow margin of profit. Thorough experience, combined with the utmost economy in connection with every detail, was necessary to avoid a failure. Of this latter class some, through thrift and business tact, secured a comfortable competence before old age ended their activity; some barely held their own; while, as in all other kinds of business, the percentage of failures far exceeded that of success. But the men who owned the forest lands from which their mills were stocked could keep their business going on a low market that would ruin the operators who had to buy logs, saw the stock, and depend upon the market for a margin. The landowners could run their mills during a period of financial depression, and, although they were getting nothing for their stumpage, were always on hand and in the market when there came a rise in prices.

LUMBER MARKETS OF NEW YORK.

In addition to the ordinary lumber business connected with forest and sawmill, there were in the State of New York great lumber markets or distributing points where lumber was sold, not only the product of the State, but immense shipments from Canada and the

Northwest as well. The two principal markets were at Albany and Tonawanda.

Albany was the center of a great lumber trade sixty years ago, and at one time surpassed all other points in the amount handled and volume of business. In 1872 there were 43 wholesale firms, with yards grouped in the "lumber district," who handled, in the aggregate, 660,000,000 feet that year, their total sales amounting to over $15,000,000. Over 1,500 men were employed in the yards unloading and loading vessels, or in piling lumber, their total annual wages exceeding $600,000. But owing to increased facilities for making direct through shipments from the mills to the retailers, combined with unfavorable discriminations in freight rates, the business at Albany has declined so largely that the amount of lumber handled this year will not exceed 200,000,000 feet. The White Pine from this market is shipped chiefly to New England (including Boston, Newport, Fall River, and Nantucket), to Long Island, the Hudson River towns, New York City, the West Indies and South America, the Azores and Africa, and Australia. The shipments of spruce are confined mostly to Greater New York, Long Island, and Hartford.

Tonawanda, unlike Albany, is a market in which all the lumber handled comes from outside the State—from the great pineries of the Northwestern States and Ontario. Still, some mention of it seems pertinent on account of the volume of the business done there. Next to Chicago and New York City, it is the greatest lumber market in the United States or Canada. The entire stock received is reshipped by rail or canal to other places, wherein it differs from Chicago and Greater New York, the latter places consuming a large portion of their lumber receipts within their own limits.

The business at Tonawanda commenced in 1857, when its first cargo of lumber was shipped from Canada by Brunson & Co. In 1865 it had become an important point in the general lumber business of the country, and its trade increased steadily until 1890, when it attained its maximum volume. In the latter year the receipts from the Great Lakes at this port amounted to 718,650,900 feet, to which may be added 13,039,600 lath and 52,232,300 shingles. Their combined values indicate a business that year of over $16,000,000. The number of persons employed—yard men, planing-mill hands, stevedores, and office men—is estimated at over 3,000, their aggregate annual wages exceeding $1,500,000. But the shipments have declined materially within the last ten years, the receipts in 1900 being reported at 396,429,483 feet. This decrease is due to through shipments from the West of carload lots direct to the retail yards in the Eastern States, and to disadvantages in freight rates. Still, the lumber business at Tonawanda is immense, employing a great many men and distributing a large amount of money annually in wages; and, as a distributing point for New England and

the Middle States, it contributes materially to the commercial supremacy of New York.

Oswego was also an important distributing point, where a large amount of Canadian lumber was handled and reshipped by canal. In 1870 the receipts of lumber at this port amounted to 289,315,329 feet.

The city of New York, owing to its export trade and large local demand, is also the center of an immense lumber trade. In the year 1900 the total receipts of lumber from ocean, canal, river, and rail aggregated 1,246,014,604 feet.

The lumber industry in this State has been affected to some extent at different times by the tariff laws relating to Canadian imports. Until recently the amount of lumber imported from Canada equaled or exceeded the amount produced in the State; and the fact that New York is a border State, with numerous entry ports on the lakes, already in close proximity to the Canadian mills, and brought still nearer by easy rail and water transportation, rendered its markets peculiarly susceptible to foreign competition, and attracted thither the bulk of the importation. In 1854 Hon. William L. Marcy, then Secretary of State at Washington, made a reciprocity treaty with Canada, under which lumber was admitted into the United States free of duty for ten years. Since 1865 the duties on sawed lumber have varied, and in some years have been withdrawn altogether. The present tariff imposes a tax of $2 per 1,000 feet on sawed lumber, which is equivalent, on an average, to an ad valorem duty of about 13 per cent.[a] Under this impost the Canadian imports have fallen off one-half within the last two years.

Such, in brief, is the history of lumbering and the lumber industry in the State of New York brought down to the present time. It is interesting to note that improved methods of lumbering and a conservative system of forestry have been introduced in the woodlands of the State, which mark a distinct epoch in the history of the industry and promise to make the forests a still more important and beneficent factor in the economy of the Commonwealth. Already some of the largest private timber tracts in northern New York are being lumbered under a system that not only insures immediate profit, but makes ample provision for forest preservation and a perpetual timber supply. The cutting is restricted not only to certain species, but to a fixed diameter, which leaves a good number of the same species as the basis of another crop. Further provision for the future growth of mer-

[a] The present tariff, enacted in 1897, puts a duty of $2 per 1,000 feet on sawed pine, spruce, hemlock, balsam, maple, birch, beech, elm, ash, and walnut; and a duty of $1 per 1,000 feet on whitewood, sycamore, and basswood. Cedar, when sawed, is admitted at 15 per cent ad valorem. On planed lumber an additional charge is made of 50 cents per 1,000 feet for each side dressed; and 50 cents more per 1,000 feet for tongued and grooved boards or flooring.

chantable timber is made by leaving, at suitable intervals, healthy individuals to serve as seed trees in propagating a wind-sown crop of seedlings in the openings. Economical methods of felling trees have been introduced which protect the young growth and in addition yield more timber per tree. New industries have arisen that are dependent on forest products and utilize much of the material which heretofore has gone to waste.

The work is placed under the charge of skilled foresters, who mark each tree that is to be cut, and allow nothing cut that is not marked. The protective functions of the forest are carefully guarded, and no trees whatever are allowed to be cut on steep sidehills, or where a cutting might result in windfalls, soil erosion, or denudation.

The great primeval forests owned by the State have been carefully examined by competent foresters. Intelligent working plans have been made under which the matured timber may be removed from time to time and a permanent annual revenue secured to the State whenever the present constitutional restrictions are removed. And so, profiting by the lessons of the past and encouraged by the success of the present, the great lumber industry of the State enters upon another century of its existence with every promise that it will continue to add its full share to the honor and prosperity of the Commonwealth.

APPENDIX.

THE ROLL OF PIONEER LUMBERMEN.

It may fairly be assumed that in each locality throughout the State the commencement of the lumber industry was coincident with the erection of the first sawmill; all work before that was confined to individuals who labored to supply their personal needs only. But with the building of a mill there ensued a combination of labor to supply a general demand, which constituted to some extent what is known as lumbering operations.

In the statistics here appended will be found the year when the first settler located in each town mentioned, the list including the greater part of the State; also, the year in which the first sawmill was built in that town, together with the name of the pioneer who built it. Most of these towns of course had no existence then as towns, and the date given here means that the foundation of the first settlement or sawmill occurred at that time in a locality which to-day is within the town named.

The historical facts here given were compiled by the author from the various town and county records in the State Library at Albany. Much valuable information relating to the first settlement of each town was found in Hough's Gazetteer of the State of New York, and some interesting facts connected with colonial times were obtained from Dr. O'Callaghan's Documentary History of New York.

As this part of the work necessitated a careful examination of the early history of each one of the 977 towns in the State, it will be seen that the task required no small amount of time and patience. This information, however, will be of little interest to the general reader; and the question may arise whether the result is worth the cost. In answer it should be said that any history of the lumber industry must properly commence with the beginning of that industry, and that there was no other way to determine when it began except by ascertaining the date when the first sawmills were put in operation in the various localities.

It may be noticed that the list is incomplete as regards some of the towns in the Hudson and Mohawk valleys. An exhaustive examination was made of the town and colonial records relating to that region, but with only partial success, as but little mention is made in them of the erection of sawmills, or of the lumber industry. These valleys, however, contained the oldest settlements, and from their borders the wave of civilization spread outward through the State, its advance being marked everywhere by the advent of the lumberman and his mill. Next came the church and the schoolhouse.

The beginnings of the lumber industry in the State of New York.

County.	Town.	First settlement.	First sawmill.	Built by—
Albany	Albany	1680	1654	Jacob Janse Flodder.
	Berne	1750	1755	Jacob Weidman.
	Coeymans	1673	1651	Hans Jansen.
	Knox	1789	1800	Amos Crary.
	New Scotland	1700	1760	Uziah Conger.
	Watervliet	1700	1775	Shaker Colony.
	Westerlo	1763	1795	Lobdell & Baker.

The beginnings of the lumber industry in the State of New York—Continued.

County	Town.	First settlement.	First sawmill.	Built by—
Allegany	Alfred	1807	1821	E. S. Davis.
	Allen	1820	1820	Moses Treat.
	Alma	1833	1843	John W. Post.
	Almond	1796	1806	Phineas Stevens.
	Amity	1804	1806	Philip Church.
	Andover	1795	1819	Luther Strong.
	Angelica	1802	1803	Philip Church.
	Belfast	1803	1809	David Sanford.
	Birdsall	1816	1823	Hull & Peterson.
	Bolivar	1819	1822	Cowles Brothers.
	Burns[a]	1805	1813	David McCardy.
	Caneadea	1803	1816	John Hoyt.
	Centerville	1808	1813	Blanchard & Hotchkiss
	Clarksville	1822	1832	Samuel King.
	Cuba	1814	1815	William Downer.
	Friendship	1806	1815	Ebenezer Steenrod.
	Genesee	1823	1820	Newman Crabtree.
	Granger	1816	1819	Isaac Van Nostrand.
	Grove	1818	.....	John S. Culver.
	Hume	1807	1807	Roger Mills.
	Independence	1798	1800	John Cryder.
	New Hudson	1820	1829	James Davidson.
	Rushford	1808	1815	Matthew P. Cady.
	Scio	1805	1822	Benjamin Palmer.
	Ward	1817	1818	Stephen Easton.
	Wellsville	1801	1803	Nathaniel Dyke.
	West Almond	1816	1833	Enoch Hawks.
	Willing	1825	1829	Elijah Robinson.
	Wirt	1812	1824	Alvin Richardson.
Broome	Barker	1791	1801	Simeon Rogers.
	Chenango	1784	1788	Henry French.
	Colesville	1785	1792	Robert Harper.
	Conklin	1788	1808	Robert Corbett.
	Fenton	1788	1797	Elisha Pease.
	Lisle	1791	1796	Edward Edwards.
	Sanford	1787	1791	Nathan Dean.
	Vestal	1785	1795	Bethias Du Bois.
	Windsor	1786	1797	Nathan Lane.
Cattaraugus	Allegany	1820	1826	Reuben Lamberton.
	Carrollton	1814	1826	Marcus Leonard.
	Cold Spring	1820	1820	Crook & Basson.
	Conewango	1816	1819	Sampson Crooker.
	Dayton	1810	1817	Silas Nash.
	East Otto	1812	1823	Moses T. Beach.
	Ellicottville	1815	1821	Orin Pitcher.
	Farmersville	1817	1824	James Worden.
	Franklinville	1806	1809	Henry Conrad.
	Freedom	1811	1821	Enoch Howlett.
	Great Valley	1812	1812	James Green.
	Hinsdale	1806	1815	Lewis Wood.
	Humphrey	1815	.....	Foster B. Salisbury.
	Ischua	1812	1814	A. M. Farwell.

[a] The first deaths among the settlers in this town were those of Jeremiah Gregory, who was killed by the fall of a tree, April 4, 1812, and his twin brother, killed in the same manner, on September 17, same year.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Cattaraugus	Leon	1819	1824	Ebenezer Collar.
	Little Valley	1807	1809	David Powers.
	Lyndon	1808	1843	Jason Sherman.
	Machias	1813	1822	Andrew McBuzzell.
	Mansfield	1817	1837	Clark Brothers.
	Napoli	1818	1829	James Wait.
	New Albion	1818	1836	Mathew Nealy.
	Olean	1804	1807	Shepard & Thrall.
	Otto	1816	1822	Isaac W. Sherman.
	Perrysburg	1815	.....	Isaac Balcom.
	Persia	1811	1814	Ahaz Allen.
	Portville	1805	1807	Green & Dodge.
	Randolph	1820	1823	Thomas Harvey.
	South Valley[a]	1798	1801	Quaker Colony.
	Yorkshire	1810	1814	Isaac Williams.
Cayuga	Brutus	1800	1808	Lewis Putnam.
	Conquest[b]	1800	1808	—— Twitchell.
	Sterling	1805	1817	John Cooper.
	Throop	1790	1798	Prentice Palmer.
Chautauqua	Arkwright	1807	1818	Benjamin Orton.
	Carroll	1807	1811	John Frew.
	Charlotte	1809	1810	Samuel Sinclair.
	Cherry Creek	1812	1824	William Kilbourn.
	Ellery	1806	1808	William Bemus.
	Ellicott	1806	1808	Edward Works.
	Gerry	1811	1819	Hines & Newton.
	Hanover	1797	1804	Abel Cleveland.
	Harmony	1805	1810	Reuben Slayton.
	Kiantone	1807	.....	Robert Russell.
	Mina	1816	1824	Alex Finley.
	Poland	1805	1805	Dr. Thos. R. Kennedy.
	Pomfret	1804	1807	Baker, Berry & Co.
	Villenova	1810	1815	John Kent.
	Westfield	1801	1804	John McMahan.
Chemung	Ashland	1788	1800	Isaac Baldwin.
	Baldwin	1813	1828	Elisha Hammond.
	Big Flats	1787	1795	William Miller.
	Catlin	1816	1827	James Wheeler.
	Chemung	1786	1790	Maj. Wm. Wynkoop.[c]
	Erin	1815	1824	McMillan Brothers.
	Horseheads	1787	1805	Nathan Teal.
	Southport	1788	1798	Col. Abraham Miller.
	Van Etten	1795	1800	Isaac Swartwood.
	Veteran	1775	1805	—— Teal.
Chenango	Afton	1786	.....	Cooper & Miner.
	Columbus	1791	1794	Job Vail.
	Green	1792	1795	Conrad Sharp.
	Lincklaen	1796	.....	Catlin & Shipman.
	Macdonough	1795	1798	Henry Ludlow.

[a] The mills did work for the white settlers on the usual terms, and furnished lumber for the Indians free.

[b] In 1804 James Perkins built the first framed house, sawing out all the lumber with a whipsaw. The building was still standing in 1859, a monument of persevering industry.

[c] Major Wynkoop built the first frame house in this town, the boards and timbers for which were sawed out with a whipsaw.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Chenango	New Berlin	1790	.....	Job Vail.
	Norwich	1788	.....	Elisha Smith.
	Otselic	1800	.....	James Rush.
	Smithville	1797	1805	Timothy Scoville.
Clinton	Altona	1800	1819	Benjamin Mooers.
	Ausable	1794	1806	Thaddeus Mason.
	Black Brook	1823	1825	Burt & Vanderwarker.
	Champlain	1789	1787	Lieut. Pliny Moore.
	Chazy	1783	1801	Atwood Brothers.
	Clinton	1818	1850	John McCoy.
	Ellenburg	1800	1824	John R. Murray.
	Mooers	1796	1804	George Perry.
	Peru	1785	1810	John Cochran.
	Plattsburg	1765	1769	Count de Freydenburgh.
	Saranac	1802	1806	Isaiah Ferris.
	Schuyler Falls	1794	1801	Ezra Turner.
Columbia	Canaan	1766	1774	Col. William B. Whiting.
	Kinderhook	1661	1665	Frank Pieters Clavers.
	Livingston	1708	1710	Robert Livingston.
Cortland	Marathon	1794	.....	John Hunt.
	Taylor	1794	1816	Rockwell Brothers.
	Virgil	1792	1801	Daniel Edward.
	Willet	1793	.....	Benjamin Wilson.
Delaware	Andes	1770	1811	John Vaughn.
	Bovina	1792	1802	Matthew Russell.
	Colchester	1774	1790	William Rose.
	Davenport	1786	1792	Daniel Prentice.
	Delhi	1784	1800	Oliver Peake.
	Franklin	1784	1806	Samuel Hutchinson.
	Hamden	1779	1799	Peake & Ward.
	Harpersfield	1776	.....	Col. John Harper.
	Kortright	1773	1780	Ezekiel Johnson.
	Masonville	1792	1799	Joseph Bushnell.
	Middletown	1763	1790	Benjamin Akerly.
	Roxbury	1789	1805	—— Ferris.
	Sidney	1772	1790	—— Carr.
	Stamford	1790	1795	Joseph Warn.
	Tompkins	1780	1786	Jesse Dickinson.*
	Walton	1785	.....	M. Goodrich.
Dutchess	Rhinebeck	1700	1740	Jacob Rutson.
Erie	Alden	1810	1814	John C. Rogers.
	Amherst	1800	1801	John Thompson.
	Aurora	1804	1806	Phineas Stephens.
	Brant	1818	1822	Samuel Butts.
	Cheektowaga	1808	1810	Samuel Le Suer.
	Clarence	1799	1804	Asa Ransom.
	Colden	1810	1811	Richard Buffum.
	Collins	1808	1809	Quaker Colony.
	Concord	1807	1812	Rufus Eaton.
	East Hamburg	1804	1803	David Eddy.
	Eden	1808	1811	Elisha Welch.
	Elma	1829	1832	—— Estabrook.

*This mill, soon after its erection, was carried away by the famous "punkin flood" that inundated the valleys of the Susquehanna and its tributaries in the fall of 1787. The cornfields were swept bare, and the yellow pumpkins that thickly dotted the surface of the swollen streams were so conspicuous that the descriptive name just mentioned survives among the household words in southern New York.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First saw-mill.	Built by—
Erie	Evans	1804	1815	—— ——.
	Holland	1807	1815	Ephraim Woodruff.
	Marilla	1829	1828	Jesse Barton.
	Sardinia	1809	1812	Sumner Warren.
Essex	Chesterfield	1792	1802	Robert Hoyle.
	Crownpoint	1804	1810	Allen Penfield.
	Elizabethtown	1792	1814	Amos Rice.
	Essex	1783	1784	Daniel Ross.
	Jay[a]	1796	1798	William Mallory.
	Lewis	1798	1809	Asa Farnsworth.
	Minerva	1804	1807	William Hill.
	Moriah	1785	1810	Alexander Spencer.
	North Hudson	1802	1812	Elihu Phelps.
	Schroon (now Schroon Lake)	1797	1814	Joseph Richards.
	Ticonderoga[b]	1769	1772	Fox & Huntington.
	Willsboro	1765	1767	William Gilliland.
	Wilmington	1803	1812	Reuben Sanford.
Franklin	Bellmont (now Belmont Center)	1816	1825	Roswell A. Weed.
	Chateaugay	1796	1797	David Mallory.
	Constable	1800	1803	James Welch.
	Dickinson	1810	1830	Warren Ives.
	Duane	1823	1823	James Duane.
	Fort Covington	1794	1796	William Gray.
	Franklin	1827	1827	McLenatham & Wells.
	Malone	1802	1804	N. & J. Wood.
	Moira	1803	1803	Appleton Foote.
	Westville	1800	1801	Amos Welch.
Fulton	Broadalbin	1783	1810	Duncan McMartin.
	Garoga	1785	1790	Cornelius Van Allen.
	Ephratah	1743	1808	Henry Yanney.
	Johnstown	1760	1762	Sir Wm. Johnson.
	Mayfield	1761	1773	Do.
	Oppenheim	1791	1806	Henry Cline.
	Stratford	1799	1806	Martin Nichols.
Genesee	Alabama	1806	1824	Samuel Whitcomb.
	Alexander	1802	1804	Rea & Fellows.
	Batavia	1801	1801	Joseph Ellicott.
	Bergen	1805	1811	Jared Merrill.
	Byron	1807	1813	William Shepherd.
	Darien	1803	1809	Amos Humphrey.
	Elba	1801	1810	Horace Gibbs.
	Oakfield	1801	1811	Christopher Kenyon.
	Pembroke	1804	1808	Samuel Carr.
	Stafford	1801	1810	Amos Stow.
Greene	Ashland	1785	1820	Marshall Lewis.
	Cairo	1760	1808	Enoch Hyde.
	Catskill[c]	1650	1684	Dirk Tennisse Van Vechten.
	Coxsackie	1695	1750	Casparus Bronk.
	Durham	1770	1783	Jared Smith.

[a] "In the vicinity of Upper Jay the lumber business was killed as early as 1820 by the girdling of all the trees to facilitate the clearing of the land." (Hist. Essex Co., by H. P. Smith, 1885. Syracuse: D. Mason & Co.)

[b] The French troops, while engaged in the construction of Fort Carillon, built a sawmill at the outlet of Trout Brook, but it was destroyed soon after.

[c] A grist and saw mill combined. Robert Livingston, in a letter writte in 1712, says: "A little mill at Catskill grinds so coarse it can not be bolted."

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Greene	Greenville	1750	1800	Nathaniel Holmes.
	Halcott (now Halcott Center)	1800	1820	Henry Hosford.
	Hunter	1800	1820	Roger Bronson.
	Jewett	1788	1795	Laban Andrews.
	Lexington	1777	1824	John Bray.
	New Baltimore	1785	1800	Charles Titus.
	Prattsville	1712	1823	—— Smedburg.
	Windham	1817	1817	Jared Clark.
Hamilton	Arietta	1827	.....	—— ——
	Benson	.....	.....	Nathan Lobdell.
	Hope	1790	.....	—— ——
	Indian Lake	1834	1849	Wing Lumber Co.
	Lake Pleasant	1795	1795	—— Foster.
	Long Lake	1830	1836	E. H. St. John.[a]
	Morehouse	1833	1833	Andrew K. Morehouse.
	Wells	1798	1829	Halsey Rogers.
Herkimer	Danube	1730	1799	Samuel Haupt.
	Fairfield	1770	.....	Samuel Green.
	Frankfort	1775	1794	John Hollister.
	Litchfield	1789	1806	—— Talcott.
	Newport	1791	1793	Benjamin Bowen.
	Norway	1786	1793	Capt. David Hinman.
	Russia	1792	1797	Benjamin Hinman.
	Stark (now Starkville)	1775	1776	Abraham Van Horne.
	Webb[b]	1799	1800	Governor John Brown.
	Wilmurt	1790	1790	Arthur Noble.
	Winfield	1792	1795	Joseph Walker.
Jefferson	Adams	1800	1802	David Smith.
	Antwerp	1803	1806	Silas Ward.
	Brownville	1799	1800	Gen. Jacob Brown.
	Champion	1797	1799	Joel Mix.
	Clayton	1802	1804	Smith & Delamater.
	Ellisburg	1797	1797	Lyman Ellis.
	Henderson	1799	1807	Willis Fellows.
	Hounsfield	1800	1802	Augustus Sacket.
	Le Ray	1801	1802	Benjamin Brown.
	Lorraine	1802	1804	—— Frost.
	Lyme	1801	1808	—— ——.
	Orleans	1806	1816	Dr. Andrus.
	Philadelphia	1804	1805	Thos. & John Townsend
	Rodman	1801	1804	William Rice.
	Rutland	1799	1802	David Coffeen.
	Theresa	1810	1810	James D. Le Ray.
Lewis	Croghan	1828	1830	Somerville Stewart.
	Denmark	1800	1801	Nathan Munger.
	Diana	1830	1833	Faskit Harris.
	High Market	1814	.....	James McVicker.
	Lewis	1799	1800	Joel Jenks.
	Leyden	1794	1795	Bela Butterfield.
	Lowville	1797	1798	Daniel Kelley.
	Martinsburg	1801	1803	Walter Martin.

[a] He built it for a landowner named Hammond, receiving a stated sum of money and five lots of land (800 acres?). Under the terms of the contract, he also cut out the first road from Newcomb to Long Lake.

[b] This mill was built at Old Forge by Governor John Brown, of Providence, R. I., the owner of Brown's Tract in the Adirondacks.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Lewis	Montague	1846	1848	S. P. Sears.
	New Bremen	1821	1826	Charles Dayan.
	Osceola	1838	1841	William Roberts.
	Turin	1797	1799	Eleazer House.
	Watson	1800	1801	Isaac Puffer.
	West Turin	1795	1796	Nathaniel Shaler.
Livingston	Avon	1785	1790	Timothy Hosmer.
	Conesus	1794	1804	—— ——.
	Leicester	1789	1792	Ebenezer Allen.
	Lima	1788	1796	Reuben Thayer.
	Livonia	1792	1795	—— Higby.
	North Dansville	1795	1796	David Scholl.
	Nunda	1806	1818	Willoughby Lovell.
	Ossian	1804	1809	Nathaniel Porter.
	Portage	1810	1816	Russel Messenger.
	Springwater	1807	1809	Samuel Hines.
Madison	Cazenovia	1793	1794	John Lincklaen.
	De Ruyter	1793	1807	Joseph Rich.
	Eaton	1793	1795	Joshua Leland.
	Georgetown	1804	1806	Mitchell Atwood.
	Lebanon	1792	.....	Elisha Wheeler.
	Madison	1793	1793	Henry W. Bond.
	Nelson	1794	1800	Jeremiah Clark.
	Smithville	1795	1801	Peter Smith.
	Stockbridge	1791	1794	Stockbridge Indians.
	Sullivan	1790	.....	John G. Moyer.
Monroe	Greece	1792	1810	Nathaniel Jones
	Henrietta	1806	.....	Jonathan Smith.
	Ogden	1802	1811	William H. Spencer.
	Parma	1794	1811	Jonathan Whitney.
	Penfield	1801	.....	Daniel Penfield.
	Riga	1805	1808	Samuel Church.
	Webster	1805	1806	Caleb Lyon.
	Wheatland	1789	1810	Peter Shaeffer, jr.
ontgomery	Amsterdam	1716	1742	Sir Wm. Johnson.
	Canajoharie	1770	1770	Col. Hendrick Frey.
	Charleston	1737	1785	Judah Burton.
	Florida	1710	1750	Philip Frederick.
	Glen	1705	1790	Peter Quackenboss.
	Minden	1750	1740	—— Fox.
	Root	1770	.....	Solomon Hamilton.
New York	Manhattan	1614	1633	West India Co.
Niagara	Cambria	1800	1806	Joseph Hewett.
	Lewiston	1800	1808	Joseph Howell.
	Newfane	1807	1811	James Van Horn.
	Porter	1803	1816	John Clapsaddle.
	Royalton	1803	1817	Gad Warner.
	Somerset	1810	1822	John Randolph.
	Wheatfield	1802	1825	Col. John Sweeney.
	Wilson	1810	1815	Daniel Sheldon.
Oneida	Augusta	1793	1795	T. Cassaty.
	Ava	1798	1801	Benjamin Jones.
	Boonville	1795	1796	Holland Land Co.
	Bridgewater	1788	.....	Major Farwell.
	Camden	1796	1798	Jesse Curtis.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Oneida	Lee	1790	1796	David Smith.
	Manchester	1787	1788	Captain Casey.
	Marcy	1793	1825	John F. Allen.
	Vienna [a]	1798	1801	Ambrose Jones.
	Westmoreland	1786	1790	Jonathan Dean.[b]
Onondaga	Camillus	1790	1806	Munro & Wheeler.
	Cicero	1790	1823	Freeman Hotchkiss.
	Clay	1793	1811	Abraham Young.
	Dewitt	1789	1792	Asa Danforth.
	Elbridge	1793	1797	William Stevens.
	Fabius	1794	1800	Thomas Miles.
	Geddes	1794	1825	Noah Smith.
	Lafayette	1791	1795	James Sherman.
	Lysander	1793	1807	Dr. Jonas C. Baldwin.
	Manlius	1790	1793	Elijah Phillips.
	Marcellus	1794	1796	Bradley & Rice.
	Onondaga	1787	1793	Turner Fenner.
	Pompey Hill	1792	1796	Pratt & Smith.
	Skaneateles	1793	1796	Jedediah Sanger.
	Spafford	1794	1810	Josiah Walker.
	Tully	1795	1810	Peter Van Camp.
	Van Buren	1792	.....	Skeels & Paddock.
Ontario	Canadice	1807	.....	John Algur.
	East Bloomfield	1789	1790	General Fellows.
	Farmington	1789	1795	Smith Bros.
	Gorham	1789	1807	Buckley & Craft.
	Naples	1790	1792	Clark & Metcalf.
	Phelps	1789	1795	Seth Dean.
	Richmond	1789	1795	Thomas Morris.
	Seneca	1787	1793	P. B. Wisner.
	South Bristol	1789	1795	Gamaliel Wilder.
	Victor	1789	1792	E. & J. Boughton.
	West Bloomfield	1789	1798	Ebenezer Curtis.
Orange	Chester	1751	1810	Richard Bull.
	Crawford	1740	1751	Johannes Snyder.
	Montgomery	1722	1768	Robert Milliken.
	Newburgh	1709	1784	Capt. Thomas Machin.
	New Windsor	1685	1728	Samuel Hazard.
	Wallkill	1767	1776	—— Carpenter.
	Warwick	1719	1760	Daniel Burt.
	Wawayanda	1738	1760	Isaac Finch.
Orleans	Barre	1811	1816	William White.
	Clarendon	1811	1811	Eldridge Farwell.
	Gaines	1808	1813	Henry Drake.
	Kendall	1812	1819	Auger & Boyden.
	Ridgeway	1809	1805	Holland Land Co.
	Shelby	1810	1812	Joseph Ellicott.
Oswego	Albion	1812	1813	Lilly Bros.
	Amboy	1805	1822	Joseph Murphy.
	Boylston	1810	1822	Reuben Snyder.
	Constantia	1790	1795	George Scriba.
	Granby	1792	1814	Schenck & Wilson.

[a] The first death in the town occurred by an accident in a sawmill in 1801, whereby Alex Graves was killed.

[b] A MS. account of Indian mythology written by Mr. Dean is in the State Library, Albany, N. Y.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Oswego	Hannibal	1802	1811	Silas Crandell.
	Mexico	1798	.....	George Scriba.
	New Haven	1798	1805	Ira Foot.
	Orwell	1806	1810	Joseph Watson.
	Palermo	1806	1812	Phineas Chapin.
	Parish	1804	1807	Way & Allen.
	Redfield	1798	1801	—— ——.
	Richland	1801	1806	John Hoar.
	Sandy Creek	1804	1805	William Skinner.
	Schroeppel	1800	1819	H. W. Schroeppel.
	Volney	1793	1796	—— Goodell.
	Williamstown	1801	1803	Isaac Alden.
Ostego	Maryland	1793	1795	Jotham Houghton.
	Middlefield	1775	1775	Alexander McCollum.
	Milford	1770	1792	Matthew Cully.
	Roseboom	1800	1806	Abram Roseboom.
	Springfield	1762	1775	Garret Staats.
	Westford	1790	1796	Artemas Howe.
	Worcester	1789	1791	Silas Crippen.
Putnam	Carmel	1739	1750	—— Kellogg.
	Kent	1754	1783	Elisha Cole.
	Phillipstown	1730	1762	Col. Beverly Robinson.
	Putnam Valley	1740	1785	Isaac Post.
	Southeast	1730	1740	Col. Jonathan Crane.
Queens	Jamaica	1656	1675	Joseph Carpenter.[a]
	Oyster Bay	1653	1673	Henry Townsend.[b]
Rensselaer	Berlin	1765	1780	Amos Sweet.
	Grafton	1786	1799	Josiah Litchfield.
	Sandlake	1766	1791	Solomon Taylor.
	Stephentown	1765	1800	—— Younglove.
	Troy City	1659	1663	Jan Barentson Wemp.
Richmond	Castleton	1640	1669	John Palmer.
Rockland	Ramapo	1740	1795	John Suffern.
St. Lawrence	Brasher	1814	1815	G. B. R. Gove.
	Canton	1800	1802	Stillman Foote.
	Colton	1824	1825	Horace Garfield.
	De Kalb	1803	1809	Charles Boreland.
	Edwards	1812	1824	Job Winslow.
	Fine	1823	1828	James C. Haile.
	Fowler	1807	1808	James Haile.
	Gouverneur	1806	1809	Lewis R. Morris.
	Hermon	1812	1818	Milton Johnson.
	Hopkinton	1803	1824	Isaac R. Hopkins.
	Lawrence	1807	1809	Ephraim Martin.
	Lisbon	1800	1804	D. W. Church.
	Louisville	1800	1805	Asa Day.
	Macomb	1817	1818	Timothy Pope.

[a] Joseph Carpenter and Caleb Carman entered into an agreement with the town, whereby they were permitted to use timber from the common lands, "except clapboard and rayle trees under 18 inches," and were to saw for the town "twelve pens in the hundred cheaper than any other persons of any other town"; and for citizens of the town "that bringeth the timber, one-halfe of the sawn stuff for their laboure, provided that it is only for their owne use."

[b] For building this mill the town granted to Townsend and his heirs forever the right to cut and use timber from any part of the town he should choose; also the right to sell such timber either in the town or out of it.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
St. Lawrence	Madrid	1801	1803	Seth Roberts.
	Massena	1792	1792	Amable Foucher.
	Norfolk	1809	1810	Timothy W. Osborn.
	Ogdensburg [a]	1749	1751	Father Picquet.
	Oswegatchie	1796	1797	Nathan Ford.
	Parishville	1810	1810	Barnes Brothers.
	Pierrepont	1807	1819	Cox & Dimmick.
	Pitcairn	1824	1828	P. Jenny.
	Potsdam	1803	1803	Benjamin Raymond.
	Rossie	1807	1810	D. W. Church.
	Russell	1805	1805	Joel Clark.
	Stockholm	1802	1804	Samuel Reynolds.
Saratoga	Charlton	1774	1783	John Rogers.
	Greenfield (now Greenfield Center)	1784	1789	Gershem Morehouse.
	Hadley	1783	1791	Delane & Hazard.
	Halfmoon	1690	1762	—— ——.
	Northumberland	1775	1777	—— Munroe.
	Providence	1775	1786	—— Corey.
	Wilton	1774	1784	John Laing.
Schenectady [b]				
Schoharie	Broome	1791	1794	Griswold & Wells.
	Cobleskill	1750	1774	Christian Brown.
	Jefferson	1794	1796	Stephen Judd.
	Richmondville	1770		Company of settlers.
	Seward	1754	1773	William Hynds.
	Sharon	1771	1784	John Hutt.
	Summit	1794	1798	—— Van Buren.
	Wright	1771	1783	Zimmer & Becker.
Schuyler	Catharine	1788	1791	Phineas Bowers.
	Cayuta	1798	1816	Jesse D. White.
	Dix	1798	1828	Col. Green Bennett.
	Hector	1790	1795	Reuben Smith.
	Orange	1802		Wm. Conlogue.
	Reading	1790		Eliadia Parker.
	Tyrone	1799	1801	—— ——.
Seneca	Fayette	1789	1797	Samuel Bear.
	Seneca Falls	1787	1795	Wilhelmus Mynderse.
	Tyre	1794	1807	Nicholas Traver.
Steuben	Addison	1791	1793	George Goodhue.
	Avoca	1800	1809	Henry Kennedy.
	Bath	1793	1793	Chas. Williamson.
	Bradford	1793	1795	Frederick Bartles.
	Cameron	1800	1808	Richard Hadley.
	Campbell	1800	1807	Campbell & Stephens.

[a] In an official report made to the Canadian Parliament in 1851, entitled "Titles and documents relating to the seignorial tenure," there is a copy of the grant made to Abbé Picquet giving permission to build a sawmill. This concession, signed by François Bigot, the intendant at Quebec, states "that for the usefulness of the said mill it is necessary that there should be attached thereto a tract of land on which to receive the saw logs as well as the boards and other lumber," and grants for this purpose "land of one arpent and a half in front by the same depth." This land now forms part of the city of Ogdensburg.

[b] The colonial patent of 1684, embracing lands in this county and the present site of the city of Schenectady, refers to sawmills which had already been built within the territory granted; but nothing appears now in the town and county records to show when or by whom they were erected.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Steuben	Caton	1819	1822	Abner Gilbert.
	Cohocton	1796	1808	Jonas Cleland.
	Corning	1788	1793	Ichabod Patterson.
	Dansville	1804	1816	Robert Fuller.
	Erwin	1787	1820	Samuel Erwin.
	Fremont	1812	1816	Daniel Upson.
	Hartsville	1809	1827	Daniel P. Carpenter.
	Hornby	1814	1824	Levi Nash.
	Hornellsville	1792	1795	George Hornell.
	Howard	1806	1810	Henry Kennedy.
	Jasper	1807	1811	Nicholas Prutsman.
	Lindley	1790	1793	Eleazer Lindley.
	Pultney	1802	1810	Melchior Wagener.
	Rathbone	1794	1812	Isaac Tracy.
	Thurston	1813	1814	Paris Wheelock.
	Tuscarora	1801	1806	William Wombaugh.
	Urbana	1793	1795	John Shether.
	Wayland	1806	1815	Benjamin Perkins.
	West Union	1822	1849	John Wiley.
	Wheeler	1799	1802	Silas Wheeler.
	Woodhull	1805	1806	Caleb Smith.
Suffolk	Huntington	1653	1688	Jonathan Rogers.[a]
	Riverhead	1690	1659	John Tucker.[b]
	Smithtown	1650	1789	George Phillips.
	Southold	1640	1659	John Tucker.
Sullivan[c]	Bethel	1798	1805	John K. Beeman.
	Callicoon	1814	.....	Jacob Quick.
	Fallsburgh	1788	1795	William A. Thompson.
	Forestburgh	1783	1783	Capt. A. Cuddeback.
	Fremont	1780	1792	Aaron Pierce.
	Highland	1825	.....	N. Patterson.
	Liberty[d]	1790	1799	Capt. Chas. Brodhead.
	Mamakating	1728	1730	Manuel Gonsaulus.
	Thompson	1749	1795	William A. Thompson.
	Tusten	1763	1760	John Moore.
Tioga	Barton	1787	1803	George W. Buttson.
	Berkshire	1791	1810	Bull & Brown.
	Candor	1785	1829	Orange F. Booth.
	Newark Valley	1791	[e]1830	Patterson & Day.
	Nichols	1787	[e]1833	George Kirby.
	Owego	1785	1826	Willard Foster.
	Richford	1809	1818	Caleb Arnold.
	Spencer	1794	1800	Edmund Hobart.
	Tioga	1789	1792	Maj. Wm. Ransom.

[a] Rogers was granted permission to build a sawmill at Cold Spring on condition that he furnish lumber at a certain price "and deliver up the stream when the town wants it for a gristmill."

[b] In 1659 John Tucker "propounded for liberty to sett up a sawmill neere the head of the river, and liberty to cut all sorts of timber, but noe more of oake than fell in the common track of getting pine and cedar which were the chief inducements of getting a mill there to saw."

[c] Charles Webb, who made a survey of the Minnisink patent in 1762, makes mention in his field notes of Reeves's sawmill.

[d] This mill, which stood on the outlet of Brodhead Pond, was built wholly of logs and hewed timber. The race was constructed from large hemlock trees "with much labor and ingenuity."

[e] Steam mill. There may have been a water mill in the town before this was built; but if so there is nothing in the town records to indicate it.

25193—No. 34—02——5

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Tompkins	Caroline	1795	1800	Gen. John Cantine.
	Danby	1795	1797	Dumond & Yaple.
	Dryden	1797	1800	Ruloff Whiting.
	Enfield	1804	1812	Benjamin Ferris.
	Groton	1798	1811	Jonas Williams.
	Ithaca	1789	1813	Phineas Bennett.
	Newfield	1801	1809	Eliakim Dean.
	Ulysses	1791	1796	David Atwater.
Ulster	Denning	1821	1827	Dewitt & Reynolds.
	Gardiner	1724	1794	James Jenkins.
	Hardenburgh	1800	1860	Hiram Seager.
	Kingston	1650	1847	Peter J. Du Bois.
	Marlborough (now Marlboro)	1772	1780	James Hallock.
	Olive	1740	1765	Lemuel Winchell.
	Plattekill	1780	1800	Andrew Garrison.
	Rochester	1688	1703	—— ——.
	Saugerties	1710	1800	Hendrick Schoonmaker
	Shandaken	1800	1860	D. C. Dutcher.
	Shawangunk	1680	.....	—— Harris.
	Woodstock	1770	1829	Robert Livingston.
Warren	Bolton	1792	1813	William H. Oglesva.
	Chester	1789	1790	Jabez Mead.
	Johnsburg	1784	1790	John Thurman.
	Queensbury	1762	1764	Moses Clements.
	Stony Creek	1795	1825	James McDonald.
	Thurman	1799	1815	Caleb Reynolds.
	Warrensburgh	1784	1794	Jonathan Vowers.
Washington	Cambridge	1762	.....	Philip Van Ness.
	Dresden	1784	1815	Amos Collins.
	Easton	1762	1768	Nathan Tefft.
	Fort Ann	1781	1788	Jacob Van Wormer.
	Fort Edward	1764	.....	William Duer.
	Granville	1772	1787	Nathaniel Spring.
	Greenwich	1766	1773	Daniel Rose.
	Hebron	1770	.....	William Lytle.
	Kingsbury	1764	1768	Albert Baker.
	Putnam	1784	1802	Robert Cummings.
	White Creek	1765	1790	Hercules Rice.
	Whitehall	1761	1766	Col. Philip Skene.
Wayne	Arcadia	1791	1801	Joseph Caldwell.
	Butler	1803	1819	Jacob S. Viele.
	Galen	1800	1810	Thomas Beadle.
	Huron	1796	1809	Elihu Spencer.
	Lyons	1789	1880	John Perrine.
	Ontario	1806	1811	Freeman Hopkins.
	Palmyra	1790	1795	Joel Foster.
	Rose	1805	1811	Elijah Howe.
	Savannah[a]	1808	1824	Royal Torrey.
	Sodus	1795	1800	Captain Williamson.
	Williamson	1803	1806	Jeremiah Selby.
	Wolcott	1807	1813	Elisha Plank.

[a] The stream Crusol Creek, upon which the first sawmill was built, diminished as the forests about its sources disappeared, so that in about twenty years tne mill lost its power. There is now no water-power afforded by any stream in the town.

The beginnings of the lumber industry in the State of New York—Continued.

County.	Town.	First settlement.	First sawmill.	Built by—
Westchester	Scarsdale	1701	1668	William Saxton.
Wyoming	Arcade	1808	1811	Maj. Moses Smith.
	Bennington	1802	1808	Chauncey Loomis.
	Castile	1808	1811	Robert Whalley.
	Covington	1807	1812	Sprague & Spaulding.
	Eagle	1808	1811	Amos Huntley.
	Gainesville	1805	1809	Wheelock Wood.
	Genesee Falls	1804	1815	Mumford, Smith & McKay.
	Middlebury	1802	1809	A. Worden.
	Orangeville	1805	1810	Robert Hopkins.
	Pike	1806	1809	Eli Griffith.
	Sheldon	1804	1806	William Vary.
	Wethersfield	1810	1812	Calvin Clifford.
Yates	Barrington	1800	1806	William Cummins.
	Benton	1789	1790	Dr. Caleb Benton.
	Italy	1793	1795	Asahel Stone, jr.
	Jerusalem	1789	1795	Daniel Brown.
	Middlesex	1789	.....	John Walford, jr.
	Potter	1788	1792	Arnold Potter.
	Starkey	1800	1807	Timothy Hurd.

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LIST OF BULLETINS HERETOFORE PUBLISHED BY THE DIVISION (NOW BUREAU) OF FORESTRY.

[Publications to which prices are affixed may be obtained from the Superintendent of Documents, Union Building, Washington, D. C. Numbers marked thus * are out of print.]

*No. 1. Report on the Relation of Railroads to Forest Supplies and Forestry. M. G. Kern. (Appendixes by others.) 1887.
*No. 2. Report on the Forest Conditions of the Rocky Mountains, with map showing location of forest areas. Col. Edgar T. Ensign. (Includes other papers.) 1889.
*No. 3. Preliminary Report on the Use of Metal Track on Railways as a Substitute for Wooden Ties. E. E. Russell Tratman, C. E. (Includes other matter.) 1889.
*No. 4. Report on the Substitution of Metal for Wood in Railroad Ties. E. E. Russell Tratman, C. E. (Discussion.) 1890.
*No. 5. What is Forestry? B. E. Fernow, Chief of the Division of Forestry. 1891.
No. 6. Timber Physics. Part I. Preliminary Report. B. E. Fernow. 1892. 10 cents.
No. 7. Forest Influences: Meteorological Observations. M. W. Harrington. Relation of Forests to Water Supply. B. E. Fernow. Sanitary Significance of Forests. B. E. Fernow. (Appendixes.) 1893. 15 cents.
No. 8. Timber Physics. Part II. Progress Report. (Contains reports of various authors.) 1893.
No. 9. Report on the Use of Metal Railroad Ties, and on Preservative Processes. E. E. Russell Tratman, C. E. 1894.
No. 10. Timber: Characteristics and Properties of Wood. Filibert Roth. 1895.
*No. 11. Some Foreign Trees for the Southern United States. (Sundry papers by different authors.) 1895.
No. 12. Economical Designing of Timber Trestle Bridges. A. L. Johnson, C. E. 1896. 5 cents.
No. 13. The Timber Pines of the Southern United States. Charles Mohr, Ph. D. With discussion of the structure of their wood by Filibert Roth. 1897. 35 cents.
*No. 14. Nomenclature of the Arborescent Flora of the United States. George B. Sudworth. 1897.
*No. 15. Forest Growth and Sheep Grazing in the Cascade Mountains of Oregon. Frederick V. Colville. 1898.
No. 16. Forestry Conditions and Interests of Wisconsin. Filibert Roth. 1898. 10 cents.
No. 17. Check List of the Forest Trees of the United States. George B. Sudworth, Dendrologist. 1898. 15 cents.
*No. 18. Experimental Tree Planting in the Plains. Charles A. Keffer. 1898.
No. 19. Osier Culture. John M. Simpson. 1898. 5 cents.
No. 20. Measuring the Forest Crop. A. K. Mlodziansky. 1898. 10 cents.
No. 21. Systematic Plant Introduction. David G. Fairchild. 1898. 5 cents.
No. 22. The White Pine. V. M. Spaulding. (Revised and supplemented.) 1899. 40 cents.
No. 23. (Not yet published.)
No. 24. A Primer of Forestry. Part I. The Forest. Gifford Pinchot, Forester. 1899, 1900. 35 cents.
*No. 25. Notes on the Forest Condition of Porto Rico. Robert T. Hill, Geologist, U. S. Geological Survey. 1899.
No. 26. Practical Forestry in the Adirondacks. Henry S. Graves. 1899. 15 cents.
No. 27. Practical Tree Planting in Operation. J. W. Toumey. 1900. 5 cents.
No. 28. A Short Account of the Big Trees of California. 1900. 15 cents.
No. 29. The Forest Nursery: Collection of Tree Seeds and Propagation of Seedlings. George B. Sudworth. 1900. 10 cents.
No. 30. A Forest Working Plan for Township 40, New York State Forest Preserve. Ralph S. Hosmer and Eugene S. Bruce. With discussion of lumbering and water supply by Frederick H. Newell, Hydrographer, U. S. Geological Survey. 1901. 25 cents.

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No. 31. Notes on the Red Cedar. Dr. Charles Mohr. 1901. 10 cents.
No. 32. Working Plan for Forest Lands near Pine Bluff, Arkansas. F. E. Olmsted. 1902. 15 cents.
No. 33. The Western Hemlock. E. T. Allen. 1902.